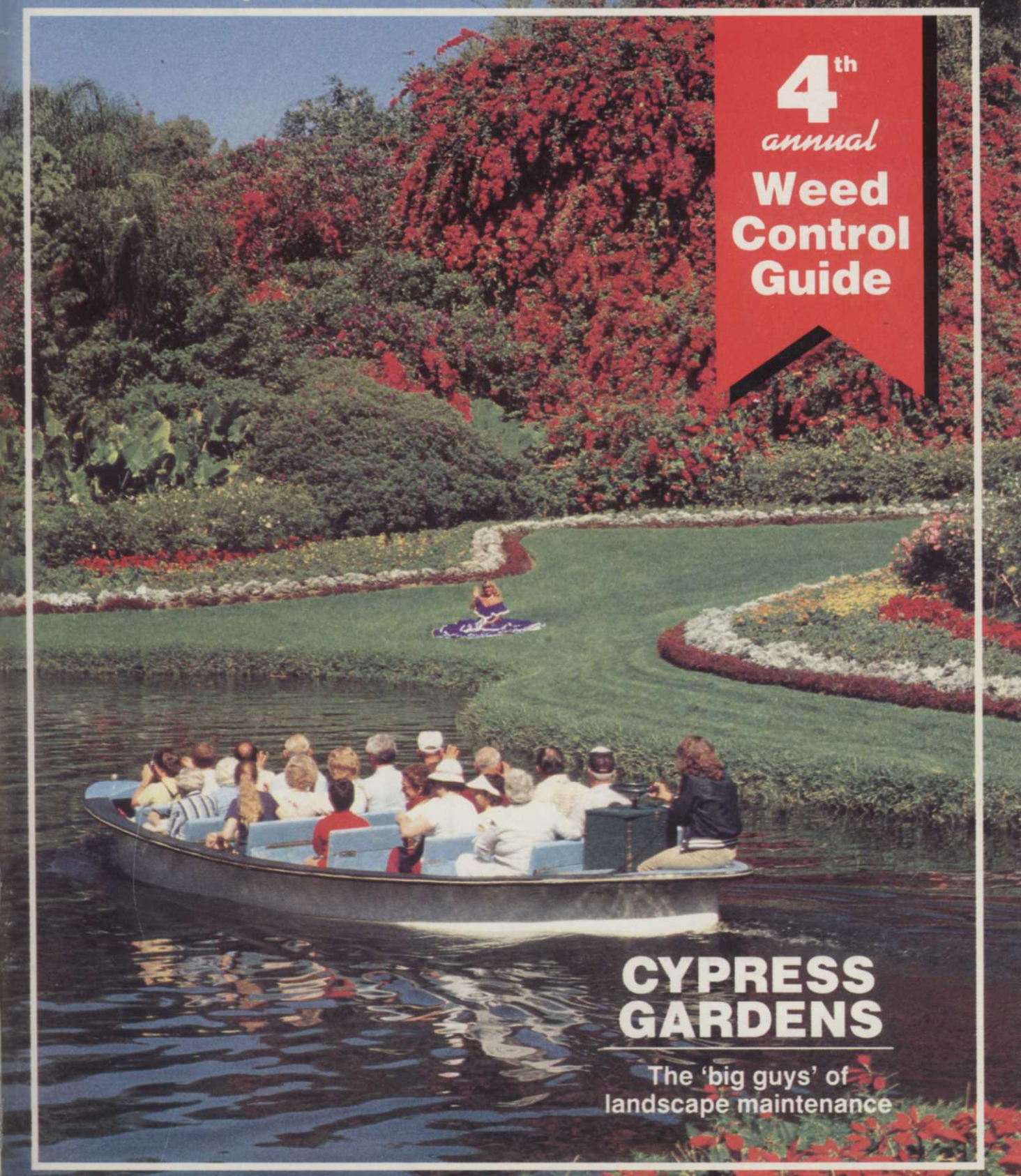
AN HBJ PUBLICATION

MARCH 1986/$2.50

WEEDS, TREES & TURF

The Magazine of Landscape and Golf Course Management Since 1962



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Wild Violet

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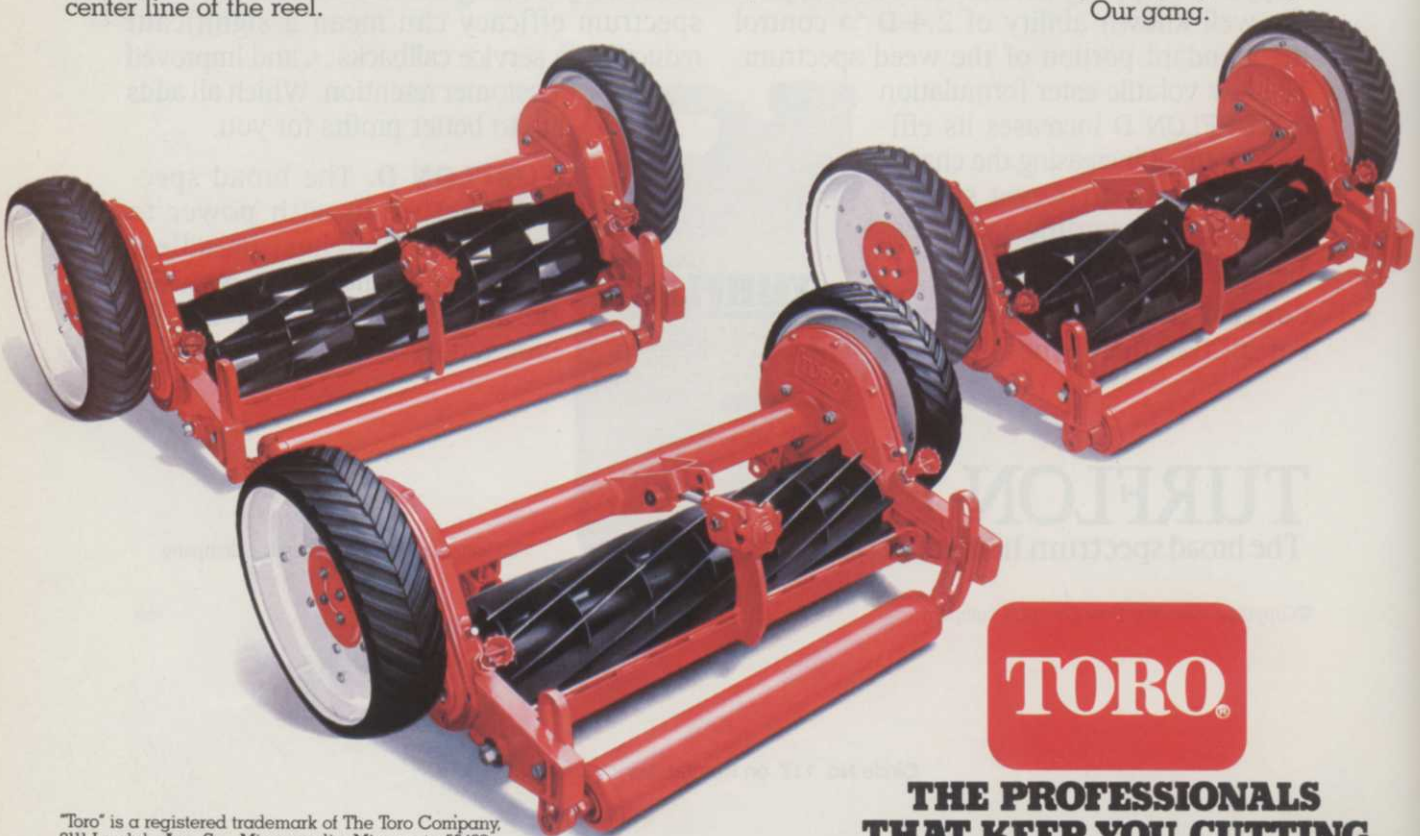

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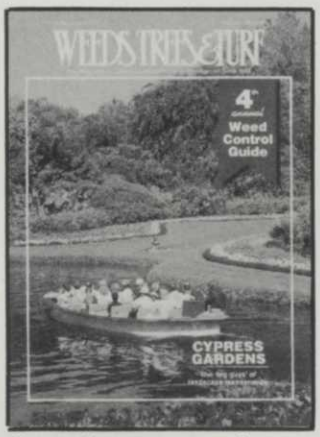

Cover photo courtesy of Cypress Gardens.

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TODAY'S VEGETATION CONTROL SPECIALIST HAS TO LOOK A LOT OF PEOPLE STRAIGHT IN THE EYE.

Annual total vegetation control today is a lot more sophisticated than just killing weeds. You have to get the job done economically enough for your budget, simply enough for your work crews, and responsibly enough for the environment. That's why Cyanamid developed ARSENAL® herbicide. Its advanced chemistry answers the needs of all people involved.

WHY ARSENAL IS EASY ON THE ENVIRONMENT.

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CONTROLS MORE UNDESIRABLE VEGETATION.

ARSENAL has demonstrated control of a broad spectrum of weeds, vines and brush species. Tests in southern states showed that ARSENAL alone (at rates of two quarts per acre) out-performed several tank mixes for annual and perennial weed control. Even more impressive, ARSENAL was most effective on difficult species like Johnsongrass, trumpetcreeper, kudzu and red maple.

ONE APPLICATION GIVES SEASON-LONG CONTROL.

ARSENAL gives you full-season control for up to eight months in temperate climates. It fits your spray schedule, because it can be applied at any time during the growing season. ARSENAL controls not only existing vegetation, but also new weeds that germinate after application. So you get residual control for the rest of the season. On hard-to-kill vegetation, ARSENAL keeps working on the roots until complete control is achieved. In spray solution, ARSENAL is stable for several days. That means no waste due to decomposition, and no chance of under-dosing target vegetation.

ARSENAL offers broad-spectrum control, including these tough species:

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Poison ivy	Canada thistle
Greenbriar	Foxtails
Redvine	Red maple
Kochia	Kudzu
Multiflora rose	Sumac

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On railroad, highway or industrial rights-of-way, around power substations, signal boxes, bridge abutments, lumber or freight yards—wherever you need annual total vegetation control, ARSENAL is the smart new choice for the job.

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TOUGH ON WEEDS. EASY ON THE ENVIRONMENT.

ARSENAL herbicide

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Wayne, NJ 07470

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Jerry Roche

Ken Kuhajda

Heide Aungst

Golf course boom continues

■ Golf course construction and remodeling should continue to prosper in 1986, according to John Watson, president of the American Society of Golf Course Architects. The reason? Lower interest rates.

"The pent-up demand that had not been met for five years because of high interest rates was unleashed in 1985, and that momentum will continue through the next few years," Watson says.

Watson says that golf course architects face a new challenge today in designing courses which meet the needs of various players.

The sport is attracting more seniors, women and juniors. This has led to the construction of more executive courses, particularly in the Sun Belt, to accommodate older players who can't hit the long ball.

"With most new and remodeled courses having a wide range of tees, players of different ability can realize equal challenges from each hole," Watson says.

Watson adds that another trend is to remodel old courses. "Today's high-performance golf clubs and balls enable the better golfers to score higher than they should," he says. "Therefore, architects are developing master plans to phase-in new tees and greens, reposition bunkers, and add water retention ponds for both aesthetic and preservation purposes."

For more information on building or remodeling courses, write the American Society of Golf Course Architects, 221 N. LaSalle St., Chicago, IL 60601.

Slowpokes ousted from Denver's courses

■ In an effort to eliminate five to six hour 18-hole adventure the Denver Department of Parks and Recreation created a "time to play" rule last summer.

The new rule states that each group of 18-hole golfers must finish the first nine in two hours, 20 minutes or be removed from the course. Nine-hole players must finish hole number four or number 13 in one hour or face ejection.

The system works by using a time clock which stamps a group's scorecard before the first tee. A ranger checks the scorecard at holes number nine and 14. If a group is late, they can't continue on and the late time is added to the following group's time. A revised municipal code enforcing this is part of the time limit rule, in case a group refuses to leave the course for slow play.

At the Wellshire and Kennedy courses in Denver, the average time after two and a half months for nine holes was two hours, eight minutes and for 18 holes was four hours, 18 minutes.

WT&T

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With all of these new L Series models (rated at 27, 23.5 and 21 PTO hp), Kubota hasn't just left the competition behind. We've left them behind the times.

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Nothing like it on earth.

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Circle No. 134 on Reader Inquiry Card

INSECTICIDES

EPA proposes diazinon ban

The death of 546 Atlantic Brant geese at a Long Island golf course (see WT&T, Aug., 1984) has been cited as partial reason for a ban on golf course use of diazinon insecticide recently proposed by the EPA.

Steven Schatzow, EPA director, said that the agency was changing its policy to encompass not only public but wildlife health, according to a story in the *New York Times*.

Schatzow noted 60 different reports of geese, ducks, herons and pheasants which had died in large numbers on golf courses and turf farms treated with diazinon.

Waterfowl is attracted to open, grassy feeding sites of golf courses and turf farms because they can easily be seen from the air.

But there is also some concern about diazinon use on lawns, recreational areas and parks.

In its position document, the EPA further stated that it "wants to emphasize that the concern is not limited to golf courses and sod farms. The agency does not have sufficient data to evaluate all of the sites, but will require such data.Pending review...the agency may or may not initiate a special review."

Ciba Geigy Corp., the major producer of diazinon, is standing behind its product.

"It can be used safely with the proper procedures, one of which is watering it in properly," says Bob Clark of Ciba-Geigy. "We will be meeting with the EPA's Scientific Advisory Panel, probably in April, to present our case.

"This is not just a monetary matter—only 5-8 percent of the total use of diazinon is by golf courses and sod farms—but we strongly feel that our data supports use of the chemical," Clark concludes.

CHEMICALS

EPA wants MCPP research data

The Environmental Protection Agency has called for the suspension of the manufacturing of mecoprop (MCPP), a widely-used postemergence broadleaf herbicide.The EPA wants more data.

EPA has issued notices of intent to suspend to some registrants of MCPP for noncompliance with data call-in requirements. It has also done the same with a registrant of maneb, a turf fungicide.

The EPA sent suspension notices to the following MCPP registrants: Germains, Inc., Los Angeles, Calif; Arco, Inc., Irwin, Pa.; Hysan Corporation, Chicago; Estech, Inc., Chicago; Koos, Inc., Kenosha, Wis.; and NCH Corporation, Irvin, Texas.

A similar notice was sent to Agchem Division, Pennwalt Corporation, Philadelphia, to suspend production of maneb.

EVENTS

Landscape Expo to kick off on Mar. 5

The 1986 Landscape Expo will open its doors on March 5 at the Valley Forge (Pa.) Convention Center.

The convention, which expects about 6,000 visitors, is being staged by HBJ Conventions and Expositions. It is cosponsored by WEEDS TREES & TURF and LAWN CARE INDUSTRY magazines, both HBJ publications.

Registration will be available at the door.

NYSTA president Jack Sloane (right) salutes Citation of Merit winner Melvin Lucas.

ASSOCIATIONS

New Yorkers present merit citation to Lucas

The New York State Turfgrass Association presented its Citation of Merit to Melvin Lucas, Jr. during the group's turfgrass conference and tradeshow in Syracuse.

Lucas, golf course superintendent at Round Hills near New Bedford, Mass., has served as president of the Golf Course Superintendents Association of America, the NYSTA, and the Long Island Golf Course Superintendents Association.

The NYSTA elected new officers during the conference. They are: Jack Sloane, Oakwood Morningside Cemetery, Syracuse, president; William Stark III, Bellevue Country Club, Syracuse, vice president; and Steve Smith, I & E Supply, Montgomery, N.Y., treasurer.

Newly elected members to the board of directors include J.R. Brundage, Brundage Lawn Maintenance, Medina, N.Y.; Tom Charnock, Brookfield Country Club, Clarence, N.Y.; Jim Girard, Jim Girard Landscaping, Glen Falls, N.Y.; and Rick McGuinnes, Woodmere Club, Woodmere, N.Y.

The NYSTA, with 850 members, is one of the largest state turfgrass associations in the country.

TREES

Researchers getting to root of chestnut blight problems

It may not be too long before you can once again roast chestnuts on an open fire.

Scientists at Michigan State University may have discovered a cure for the chestnut blight which has killed off most American chestnut trees.

The researchers have found a naturally-occuring virus which can infect the fungus that causes the blight. The virus makes the fungus harmless, allowing the surviving chestnut roots to send up healthy shoots, which eventually grow into trees.

Although similar viruses have recently been found in chestnut trees, this is the first time scientists have succeeded in getting the virus to spread to other chestnuts.

The chestnut blight, which was first recognized in 1904, did the most damage through the 1950s, killing an estimated 3.5 billion trees.

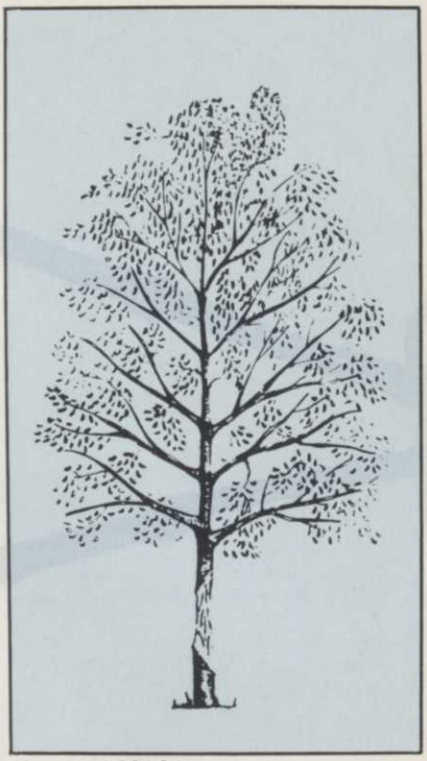
Since that time, most chestnuts roasted at Christmas have been imported from Italy.

The origin and nature of the newfound virus remains a mystery. What is known is that it differs from ordinary viruses since it lacks a protein coat.

It consists only of a double strand of RNA. Also, it can only exist in fungal cells and is only transmitted when an infected fungal cell fuses naturally with the cells of an uninfected fungi.

The mysterious disease worked quickly, decimating even the largest trees—ones 120 feet tall with 13-feet diameters—within two to three years.

The chestnut virtually disappeared from the American forest causing a recession within the American forest industry.



Chestnut blight

PESTICIDES

Expert panel cites 'national chemical scare'

"We're in the midst of a national chemical scare."

"A minefield of risks—that's how the public sees the pesticide issue. It's a black and white issue."

Dr. Allen Felsot, professor of environmental entomology at the University of Illinois, then switched gears. "I have news for you. When it comes down to economic issues, pesticides are good."

Speaking at the North Central Turfgrass Expo in Peoria, Ill., Felsot assured his audience of lawn care operators and turfmen that "the risks (of pesticide exposure) are actually quite low but you should never be complacent."

Felsot said the risks the public are exposed to each day (he cited natural radiation as one) are actually greater than those posed by pesticide exposure.

During the same session, Wendall R. Mullison, an agricultural products development research scientist with Dow Chemical, added: "Everything is toxic at some concentration, everything is non-toxic at some concentration." He attributed the quote to Paracelsus, a scientist of the Middle Ages known to some as "The Father of Toxicology."

Mullison, listing the importance of pesticide use, said the United States Dept. of Agriculture estimates that without pesticides, food production would be off 50 percent in the U.S.

Mullison, Dr. Felsot

Felsot and Mullison stressed that proper disposal of pesticides should be of paramount important to users. Mullison said incineration of those materials is a trend that will become the norm in the future.

Unfortunately there are those who disregard proper disposal procedures, said Illinois EPA agricultural advisor A.J. Taylor.

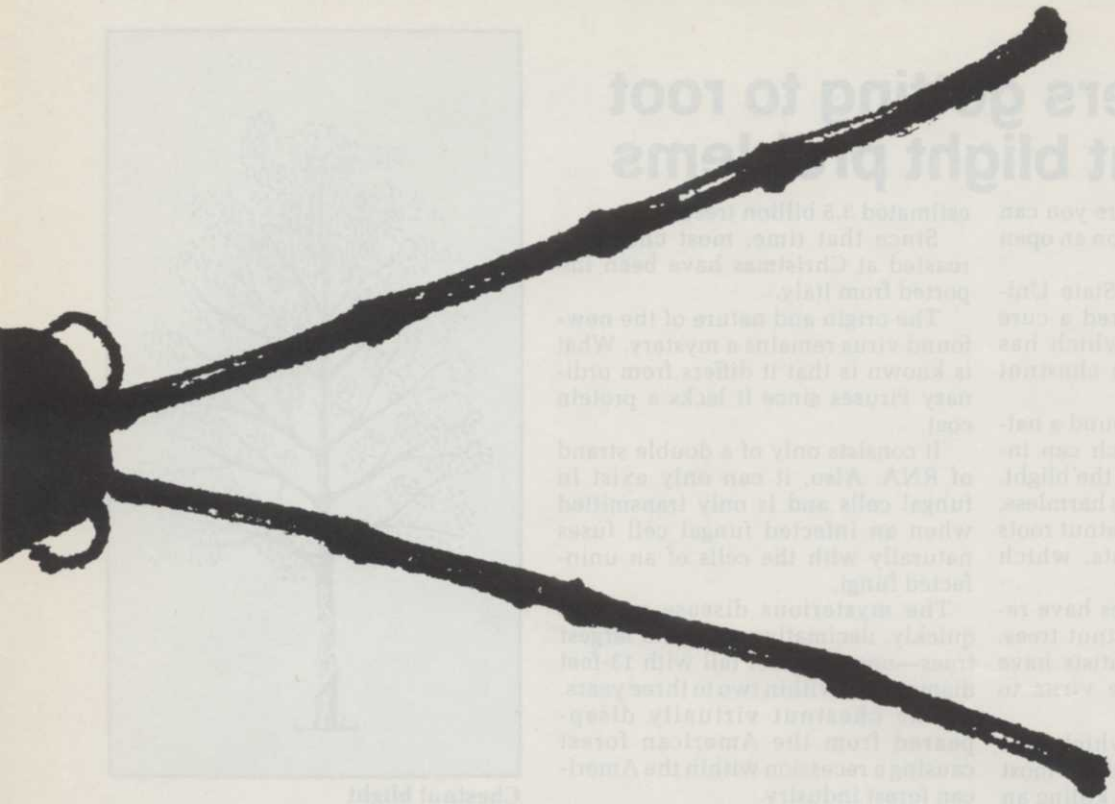
Improper handling, storage, and disposal of pesticides has resulted in higher levels of toxins in streams located near pesticide storage sites.

During his presentation, Taylor showed extreme cases of improper pesticide storage and disposal. He urged his audience to use proper handling techniques, conceding that "pesticides will continue to be used. Let's be as cautious as we can."

He cited contamination of groundwater as the "hottest issue" associated with pesticide use today.

Other speakers included:

- Dr. Jack Murray, research agronomist for the U.S. Dept. of Agriculture in Beltsville, Md., on "Potential for Breeding New Zoysiagrasses."
- Dr. William Meyer, Turf Seed Inc. of Hubbard, Ore., on "Breeding for Disease Resistance in Cool Season Turfgrasses."
- Dr. Richard Skogley, turfgrass professor at the University of Rhode Island, on "Ryegrass for Athletic Turf."
- Dr. Joe Vargas, plant pathology professor at Michigan State University, on "Take-All Patch & Disease Update."
- Dr. Kent Kurtz, turfgrass professor at Cal-Poly Pamona, on "The Wonderful World of Sports Turf."



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The bugs don't stop here.

Turf and ornamental pests don't stop at your soil line. They burrow right down below the surface, into your root systems, to eat away your profits.

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Diazinon controls 52 different pests. Yet it's easy to use, and it's non-restricted. No special clothing or equipment are necessary. You can spray Diazinon near homes, hospitals or schools. In liquid, granular or powder formulations. Mixed with fertilizers or fungicides. It's the end of the line for your worst pests.

DIAZINON

The bug stops here.

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STANDARD GOLF Pro-Line

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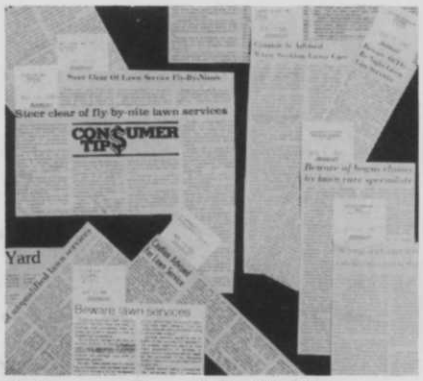
LAWN CARE

Campaign to plug lawn care gets results

Stauffer Chemical Company says its campaign to promote the professional lawn care industry gained the industry exposure in hundred of publications during 1985.

"Stauffer also received several hundred phone calls and letters from lawn care operators regarding the program," says Greg Bushman, marketing manager for the company's specialty products group. "Response to the campaign has been very positive."

Throughout 1985, Stauffer submitted articles to more than 1,100 newspapers, home and garden columnists, and university extension information offices.



Just a sampling of the "ink" generated by Stauffer Chemical's lawn care industry exposure campaign.

"These articles gave the PLCAA high exposure, as well as educating the public on proper lawn care," Bushman says.

Press kits are available from Frank Lukasik, Agricultural Chemical Division, Stauffer Chemical Company, Westport, CT, (203) 222-3254.

SEED

Turfseed report is not good for 1986

The pessimistic report on turfseed availability issued in the October, 1985 issue of WEEDS TREES & TURF has worsened, according to a leading industry observer.

Lesco Inc. vice-president Art Wick, speaking before the Nebraska Turfgrass Foundation, said, "We're concerned with the availability not only of Kentucky bluegrass but of all species."

Wick cited winter weather in the Willamette Valley of Oregon, where much of the country's turfseed is produced, as the main cause.

Temperatures and snowfall in the Pacific Northwest have not been as bad in 40 years, Wick reported. He added that, in some instances, entire crops have been lost, and that skimpy 20 percent yields among some cultivars are not unusual.

The crop of Kentucky bluegrass—hardest hit by fall rain and winter freezes—is entirely sold out for 1986, Wick also noted.

PESTICIDES

News media overplays pesticide risks, says toxicology expert

The frequency of filing injury claims related to the use of pesticides has increased in the last decade. Dr. Eric Comstock of the American Board of Medical Toxicology believes that sensationalism by the news media has caused the rise of such claims.

Comstock also blames the increase on ill-founded public hysteria caused by groups such as New York's "People Against Chlordane" and physicians with academic credentials "who regularly make reckless projections based on animal data of future human risk of cancer from trivial contact."

During his 23 years in practice, Comstock has treated about 8,000 cases concerning pesticide exposure.

The cases dealing with turf insecticides include 83 for diazinon, 43 for chlorpyrifos, 30 for baygon, and one each for maneb and daconil.

Comstock emphasizes, however, that while there have been some deaths in the thousands of cases, all survivors have shown complete recovery except for contact with one pesticide which has never been approved for use in the United States.

"There has been no instance of poisoning among consumers whose contact has been limited to the final application concentrations of the pesticides," Comstock says. "The poison mystic, fueled largely by the news media in recent years, has provoked numerous episodes of mass hysteria which burden the pest control industry with a wide spectrum of clinical conditions having no chemical relationship to the pesticide."

Comstock has labeled the condition "toxic habitation syndrome," referring to individuals with irrational anxiety about the contamination of the household or community environment.

Symptoms can include headaches,

continued on page 17

Frank J. McDonald, Director of Marketing
Cushman Division, Outboard Marine Corporation
Lincoln, Nebraska

CUSHMAN®

"Take the new 22-horsepower Cushman Front Line test-cut and we will send you a free solid brass belt buckle that proves our point."

Frank J. McDonald

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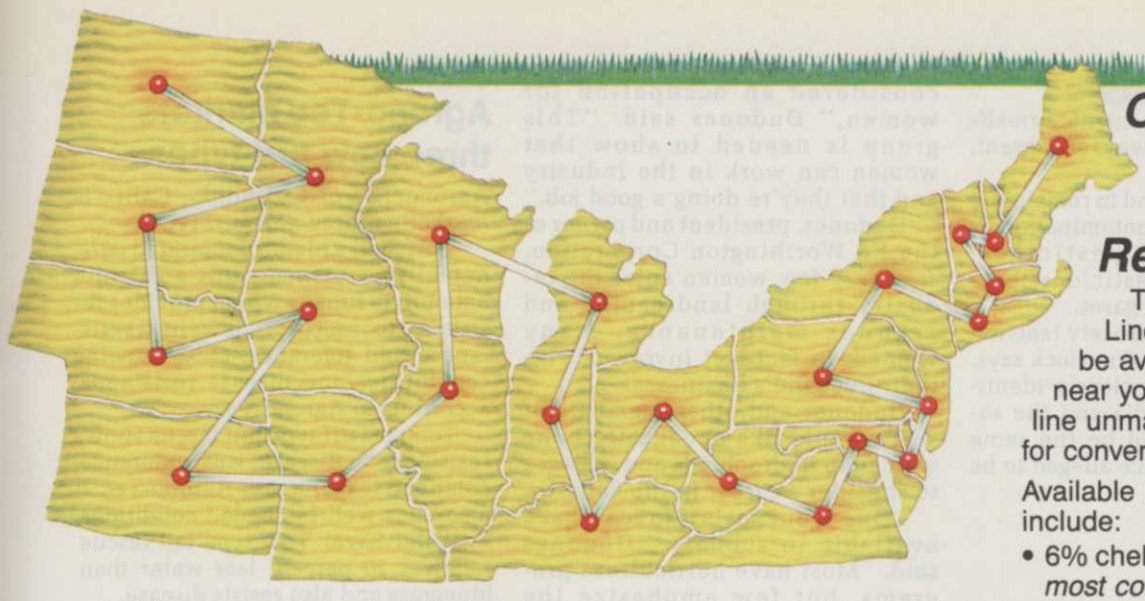

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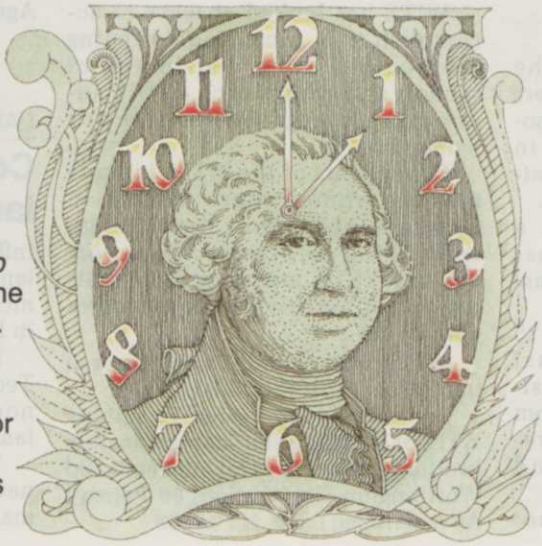

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PESTICIDES *from page 12*

nausea or skin rashes, but abnormalities in target organs always are absent, he says.

Also, symptoms tend to remain the same whether the contamination is from chlorinated pesticides, organophosphate pesticides, herbicides or a variety of gases.

"The cause of the anxiety reaction is not the substance," Comstock says. "The precipitating is clearly identified in the news media and the societal response would be the same whatever the substance alleged to be involved."

TURF

New York women form 'Women in Turfgrass'

With more women entering the turfgrass industry, several members of the New York State Turfgrass Association have organized Women in Turfgrass (WITS), a group for networking and educational purposes.

WITS made its debut with a breakfast at the NYSTA turfgrass conference and trade show late last year.

Organizer Janet Dudones said 15 women attended the breakfast meeting. Those women held positions in the industry ranging from golf course owner, to turfgrass researchers for companies and universities.

"Turfgrass was previously not considered an occupation for women," Dudones said. "This group is needed to show that women can work in the industry and that they're doing a good job."

Dudones, president and owner of the Ed Worthington Corporation, said very few women enter the industry through landscaping and grounds maintenance. Many women, in fact, get involved with their husband's businesses.

Dudones and other members of WITS would like to educate young women in high schools and colleges to consider a career in the field.

"One of our goals is to see what's available in schools," Dudones said. "Most have horticulture programs, but few emphasize the turfgrass industry."

WITS has looked at ways to accomplish this, including designing a brochure, to be distributed at schools and groups such as 4-H, advocating turfgrass careers for women.

Other goals of the WITS include making women more visible in turfgrass publications, developing a networking list, conducting a survey of NYSTA members and creating a resume file for prospective employees.

WITS plans to meet this summer at the Cornell Turf Field Day.

For women interested in joining WITS or starting a similar organization in other states, write Dudones at the Ed Worthington Corporation, 50 Petrova Ave., Saranac Lake, NY 12983.

TURF

Agrono-Tec markets three new turf types

Agrono-Tec of Escondido, Calif., is marketing three new turf types.

Turf Star, a blend of top-rated perennial ryegrass, contains a calcium endophyte fungus which provides resistance to insects. It shows heat resistance, cold tolerance, close mowing capabilities and disease resistance, according to Agrono-Tec.

Tempo Turf type tall fescue shows resistance to disease, wear tolerance, color and texture, says Agrono-Tec. It also does well in shaded conditions.

Water Saver Turf type tall fescue requires 20 percent less water than bluegrass and also resists disease.

For more information, contact Agrono Tec at (619) 480-9382.

LANDSCAPE

College now offers landscape degree

Influenced by the rapid growth of the landscape industry, a Wisconsin technical college has developed a degree in landscape management.

North Campus, Milwaukee Area Technical College in Mequon, Wis., now offers an associate degree in landscape management.

"While landscape management is a new business, it is already making its mark on what was once the provi-

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dence of a multitude of caretakers," says Mary Oberndorfer, a landscape management instructor.

The new program teaches an integrated approach to grounds planning, maintenance, and development.

The college staff worked closely with industry experts to design a program which includes both study and hands-on experience.

Students can also specialize in area such as fertilizer use, pest control, irrigation design, tree care, and construction.

For more information on the program, write the Horticulture Department, MATC North Campus, 5555 W. Highland Rd. Mequon, WI 53092, or call (414) 242-6500.

FUNGICIDES

Granular fungicide gets government OK

Mallinckrodt, Inc., has received federal registration for its Banrot 8.G, a broad spectrum granular root rot fungicide, originally introduced in 1973 as a wettable powder.

Mallinckrodt says Banrot 8.G can be used in the greenhouse, nursery, and the interiorscape. It works for the prevention and control of damping off, root rot, and stem rot caused by some water mold fungi and soilborne fungi.

Banrot 8.G is available in 40 pound drums at Mallinckrodt distributors.

CHEMICALS

Balan offered in new particle size

Elanco Products has changed the particle size in Balan herbicide to improve spreadability, reduce dust, and increase calibration accuracy, says the Indianapolis-based company.

The new particle size results from the use of a clay carrier, which spreads more uniformly than limestone or corncob carriers. New spreader settings for Balan appear on the bag.

Elanco says Balan provides preemergence control of crabgrass in turf for 8 to 10 weeks with one application. A second application controls goosegrass. It can be used on all common varieties of cool- and warm-season turfgrasses.

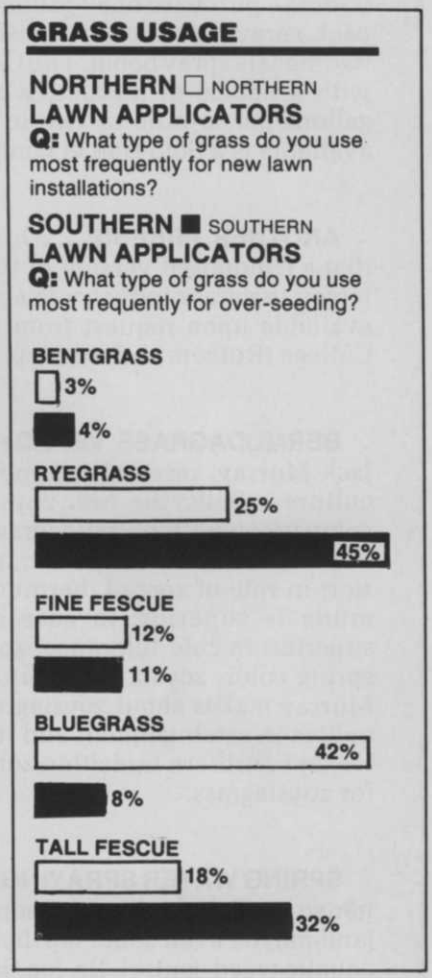
LAWN CARE

It's no surprise: Kentucky blue and rye are favorites

Kentucky bluegrass and ryegrass are the favorites of lawn care operators nationwide, according to a survey conducted by International Seeds Inc.

Forty-two of 100 northern lawn applicators who answered the survey questions cited Kentucky bluegrass as being the type of grass they use most frequently for new lawn installations. And 45 percent of 50 southern lawn applicators said they use ryegrass most frequently for overseeding.

The survey was held at the Professional Lawn Care Association of America's convention and trade show in Tampa, Fla., last November.



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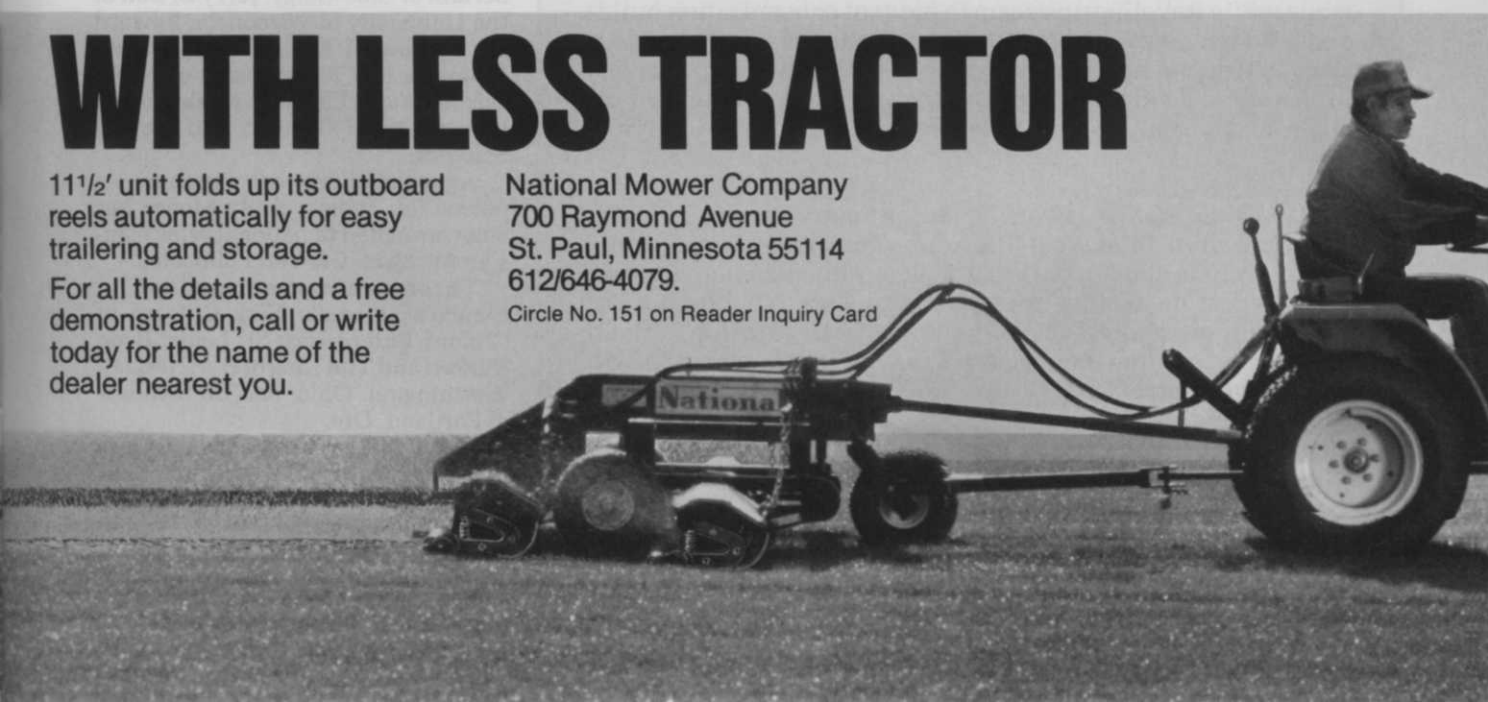

SHORTCUTS

FREEBIE..... Elanco Products Co. is giving away sprayers to users of Surflan herbicide. End users of Surflan can receive either a Solo backpack sprayer or a Chem-Lawn spray gun free with the purchase of 50 gallons of Surflan 4AS. The Solo backpack sprayer comes equipped with a pressure regulator and two-nozzle spray boom. The Chem-Lawn spray gun is available with a choice of nozzles, which provide either four to five gallons per minute or two to three gallons per minute. Also available is a Solo Hanjet compression sprayer.

ANOTHER FREEBIE..... Our friends in New Jersey tell us that a condensed version of the Economic Survey of the New Jersey turfgrass industry is available at no cost. The leaflet is available upon request from the Publications Office at Cook College (Rutgers University).

BERMUDAGRASS VS. ZOYSIAGRASS..... According to Dr. Jack Murray, research agronomist for the U.S. Dept. of Agriculture in Beltsville, Md., zoysiagrass stacks up pretty well in a comparison with bermudagrass. Here's what he says: in shade tolerance, zoysia is superior; in wear tolerance, zoysia is superior; in rate of spread, bermuda is superior; in recovery, bermuda is superior; in ease of establishment, bermuda is superior; in cold tolerance, zoysia is superior; and in fall and spring color, zoysia is superior. A couple of other points Dr. Murray makes about zoysiagrass; its major problems are difficulties in establishment and its long winter dormancy period. He says northern transition zone areas provide the best climate for zoysiagrass.

SPRING WATER SPRAYING..... Spring is just around the corner so it might be time for some of you in the transition zone (and maybe even some northern areas) to start thinking about aquatic weed control. Dr. Joe Downs, a technical specialist with Monsanto Agricultural Products Co., says there are several things you should keep in mind when using chemicals to control water weeds: 1) applications made in moving water must be made while traveling upstream to prevent concentration buildup; 2) do not apply within .5 mile upstream of a potable water intake; 3) do not apply in estuaries; and 4) do not apply on rice levees when flood water is present. Application of chemicals in water is an exact science. Exercise prudence while applying.

NO MORE POA... ... Scott Niven, property manager at The Stanwich Club, Stanwich, Conn., used to water his poa annua fairways up to four times a day to keep them cool and green. That's when he decided to make the switch to bentgrass. But Niven said he couldn't have done it without Cutless. "Can't fertilize and get the dark green that a Cutless application will give," Niven said. Using Cutless not only gave him improved color and vitality of the perennial grasses, but also reduced the mowing requirements and grass clippings (by almost 50 percent) over eight to 10 weeks. The Cutless reduced thatch and eliminated various weeds. Primarily, it inhibited the poa annua, allowing the bentgrass to grow in.

PEOPLE

Names in the news

Marshall Bossard, groundskeeper at Cleveland Municipal Stadium, has retired after a 48-year career. Bossard is the last of the famous Bossard family that for many years made the baseball field the best in the American League, following father Emil and brother Harold.

Charles R. Johnson, president of California Landscape, Canoga Park, Calif., has been installed as new president of the California Landscape & Irrigation Council. He succeeds **Mickey Strauss** of American Landscape, Canoga Park, Calif. Other officers are **Klaus W. Ahlers, Art Torres, John Carlson, William N. Cohen** and **Julie Kitch.**

Charles Johnson

Ahmed Daoud Ali has been added to the cooperative extension office of the University of California, Riverside. Ali has a Ph.D. in entomology from Louisiana State University.

John Betts has been named golf course superintendent for the Port Royal Golf Clubs, Sea Pines Plantation, Hilton Head Island, S.C. The graduate of the University of Michigan moves up from assistant superintendent.

New officers in the North Central Weed Control Conference are **Calvin G. Mesersmith** of North Dakota State University, **R. Gordon Harvey** of the University of Wisconsin, **Loyd M. Wax** of the USDA, **Earl W. Chamberlain** of Ciba-Geigy, **Jerry D. Doll** of the University of Wisconsin; **Edward W. Stoller,** of the USDA, **John W. Nalewaja** and **Alan Dexter** of North Dakota State, **Ellery L. Knake** of the University of Illinois, and **Robert Schmidt.**

Aquatrols Corp. has announced a personnel change. **Andy Moore** has been promoted to national sales manager for Aqua-Gro and Foliocote.

Three dealers were added to Elanco's network: **Nick Clifford** of Clifford Enterprises, St. Louis; **Benn Heskett** and **Tim King** of B.A. Heskett, Worthington, Ohio; and **Ed Swallow** of Portland, Ore.

Bill Riden has been named Chipco turf and ornamental product sales specialist, covering eastern Pennsylvania and New York State. He has previously worked for Mobay, W.A. Cleary and O.M. Scott & Son.

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THE BIG BOYS

Cypress Gardens, one of the most beautiful parks in the country, boasts more than 8,000 thriving plant species. That makes landscape horticulturist Norm Freel stingy with his time.

By Jerry Roche, editor

Norm Freel is a busy man. Ask him for an hour or two of his time and he gives you 45 minutes—maybe.

And with good reason: he is horticultural vice-president of the 223-acre Cypress Gardens, arguably the most beautiful park in the country.

These are the big boys of the landscape maintenance industry.

"We're not perfect, but we know we're damned good," says Freel.

More than 7,500 chrysanthemums were grown by nursery manager Gary Smith for Cypress Gardens' Mum Festival

"We try to offer the public a 365-day-a-year flower show. We've got to look good, whether we're in a freeze or extreme drought conditions.

"A guest could visit the Gardens 52 weeks of the year and each time see different plants in bloom. And you'd have to travel to 70 countries at different times of the year to see what you could see in a single day here."

You want big?

● The Gardens boast more than *8,000* thriving plant species and more than *12 million* annual blooms.

● Freel oversees the *223-acre* complex with a year-round crew of 47 employees.

● *Fifty acres* were overseeded with ryegrass four months ago. For the job, Freel ordered 12 *tons* of turfseed.

● Typically, his crews will apply 45 to 50 *tons* of fertilizer a year.

● For last winter's Mum Festival, one acre of nursery space was needed to supply *7,500* chrysanthemums in seven colors.

● More than *1,000* trees are planted each year, most of them home-grown at Cypress Gardens' own 25-acre nursery.

"In our landscape, we've tried to create 'vistas,'" Freel says during a walk through the sprawling park. "I'm a believer in big material. I like things to look like they've been in five to ten years. We try plants, products—everything from seaweed to chicken feathers."

last winter.

Horticultural vice-president Norm Freel watches over his gardens.

Weather woes

Despite Freel's immense responsibility, his No. 1 problem is no different than that of most smaller landscapers: the weather (believe it or not), despite the fact that Cypress Gardens rests on former swampland in sunny central Florida.

"Eighty percent of our material is either tropical or sub-tropical," Freel says, pointing to some beautiful giant cascading bougainvillea. "But in the last seven years, this has been a very temperate area. When the temperature gets under 40 degrees—well, that's the most nerve-wracking time of all."

Over the years, Cypress Gardens has purchased more than 1,500 kerosene, natural gas and propane heaters. It takes the crew about four hours to put the heaters out. But the worst part is that Freel can never be absolutely sure when to have them stoked up. "There are a lot of variables in the weather," he admits.

Turf technique

The evident quality of the park is testament to the dedication of its Division of Horticulture.

Maintenance of the turf takes fully 50 percent of the department's time. Thirty mowers from 18-inch Snapper two-cycle trimmers to 70-inch Excel Hustlers are used on St. Augustine, Floratam, Bitter Blue Seville, Survive and other hybrid turfgrasses. Freel also hopes to seed some areas with newly-released Floralawn; and in non-irrigated areas, Argentine bahiagrass is used.

Freel talks about the park—every little gardenia, every blade of grass—with the pride of a father. He is totally dedicated to his job.

"I'm 35 years old, and I've been with Cypress Gardens since I was 18 when I started digging holes," he says. "I've done it all."

His day begins at 6:30 a.m. six or seven days a week. Both Freel and landscape maintenance superintendent Mike Wallace spend anywhere from 50 to 70 hours a week on the job. When Freel says, "I don't expect my employees to do

A view of a portion of Cypress Gardens from the 153-foot Kodak Island in the Sky.

Freel (left) discusses current problems with Ellis Lindsey, a 40-year veteran at Cypress Gardens.

anything I haven't done," you almost have to feel sorry for the employees.

Smart cookies

Freel, who has a pair of two-year college degrees plus 40 hours completed toward his bachelor's in ornamental horticulture at the University of South Florida, is not solely responsible for the park's beauty. He retains an advisory board consisting of Dr. Thomas Scheen, Jack Siebenthaler and Everett Miller.

Dr. Scheen is a member of the University of Florida faculty. Siebenthaler is a private consultant and landscape architect. Miller is former director of Longwood Gardens, and a park designer.

When it comes to picking and choosing materials, Freel gets the input of the advisory board, management and his own "color foreman."

"We're usually planning one year ahead," he observes. "We can do anything if we have the lead time and budget."

Constant testing

To determine how to best keep the park blanketed in year-round color, Freel notes that there is not a single seed in the standard catalog he hasn't ordered and tested at the gardens.

"If something new comes on the market, we get it at once," he says. "If it flourishes, great. If it doesn't, we try the next thing that is introduced. It's a continuous process with perhaps 40 or 50 cultivars under test at all times."

To do this, Freel has more than 40,000 square feet of greenhouse plus the nursery, which is run by 10-year veteran Gary Smith. Freel says a single year's plant growth displayed at one time would blanket 100 acres and fill several football stadiums clear to the upper press box.

Deep roots

Freel is continuing the tradition set by his predecessor Bob Kuntz, who was originally hired by Cypress Gardens founder Dick Pope Sr.

It was Pope who, on Jan. 2, 1936, opened the gates of Cypress Gardens. It was Pope and his wife Julie who literally dug the drainage canals and planted the first flowers by hand, converting a desolate snake-infested swamp into a beautiful park in four years.

Ignoring cutting ridicule and titles like "Swami of the Swamp," "Maestro of the Muck" and "The Barnum of Botany," the Popes changed the alligator-ridden wasteland into a series of beautiful canals and paths winding through seas of brilliant bougainvillea, hibiscus and azalea.

A monument to the Popes' efforts still stands today: a 45-year-old banyan tree originally planted by Dick Pope Sr.

In the time it took for the sapling to grow into a magnificent beauty, the park expanded to include all known native plants and exotic flora from every continent.

So the importance of his job does not escape Norm Freel:

"Cypress Gardens and Sea World, we're the big boys of the garden business. We've got to be good." **WT&T**

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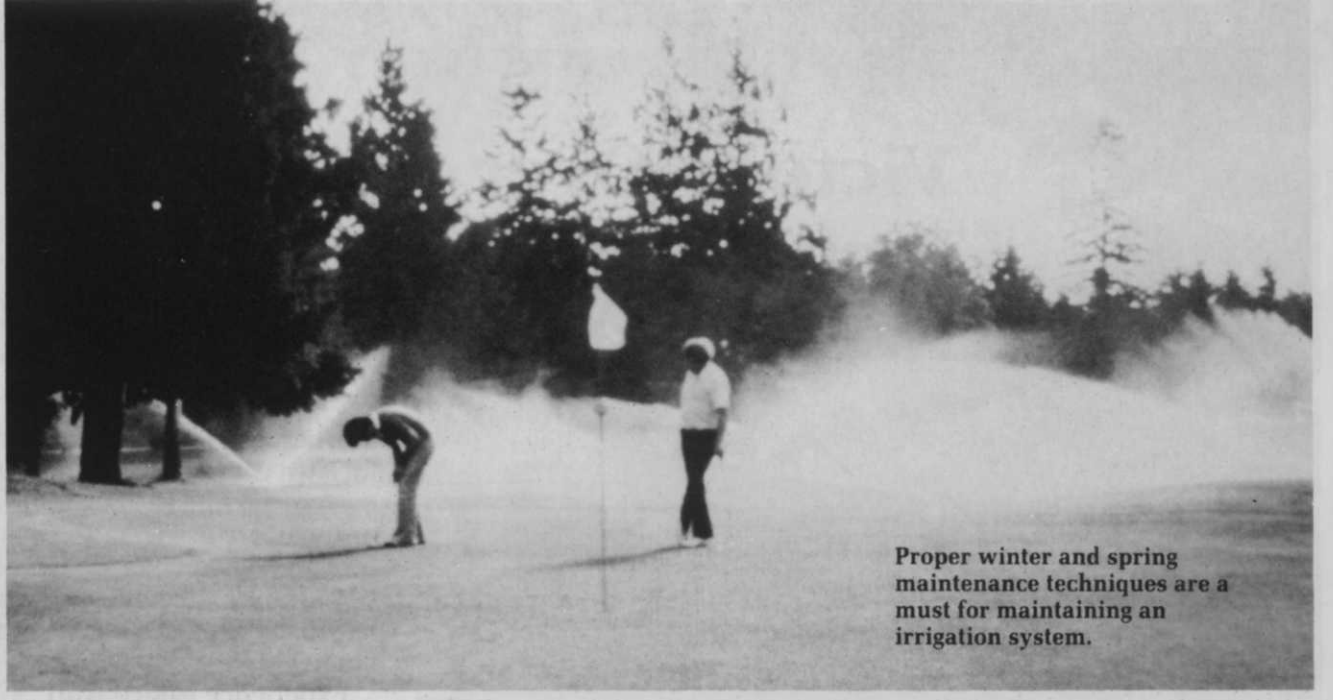

Proper winter and spring maintenance techniques are a must for maintaining an irrigation system.

SPRING TROUBLESHOOTING

As winter's ice and snow thaw, so do irrigation systems. Here are some suggestions on how to avoid spring irrigation problems, and what to do if you've got them.

by Heide Aungst, associate editor

Many golf courses, parks and institutions would be virtually paralyzed without their irrigation systems. So, for most, constant maintenance is simply a way of life.

For those with systems in the North or Midwest, the hardest work comes in late fall when the system must be "winterized." But if you tried to save time then by rushing through the process, chances are you'll lose time this spring repairing winter damage caused by negligence last fall.

"Most people do a good job winterizing, because they know what headaches there are in the spring," says Michael Bravo of Thompson Irrigation, Chino, Calif. "It can be a lot of trouble and money."

Winterizing refers to using an air compressor to blow out or evacuate all water from the system. The primary source of spring start-up problems is water left in the system piping over the winter. In any area where temperatures drop belowing freezing, water can freeze and expand, causing pipes or valves to burst.

Tony Altum, of Grounds Management Consultants, Indianapolis, Ind., says too many golf course superintendents treat winterizing systems like changing oil in a car. "Lack of concern is the biggest problem," he notes. The part of the system which needs to be replaced might not be costly in and of itself, but Altum stresses that it may take days to wait for the part to come in and labor costs can go through the roof.

Big bucks?

Although costs vary widely across the country, Don Cooper, manager of customer service for Weather-Matic in Garland, Texas, estimates it could cost about $1000 to replace a 12-inch break in the main line of a large system.

By spring, there's little hope for systems which have not been properly winterized. Even carefully evacuated systems can suffer from freeze damage warns James Burkhardt, president of James Burkhardt Associates in Columbus, Ohio. Occasionally, melting snow will get into a sprinkler head and refreeze. But, Cooper says, if the system is turned back on carefully, further damage can be minimized.

"The key is to fill the system slowly," Cooper recommends. "Dumping water into an empty line creates a water hammer which causes more breakage." Cooper says that Ts and elbows will snap easily if a pressure surge is created.

Cooper says a residential irrigation system should be recharged starting at the valve farthest from the water supply. Open the valve to let the air and water out, then bring the water pressure up slowly. Continue this process at each valve through the system.

For large commerical and institutional systems, start by opening as many valves as possible. Manually restrict the water flow to the heads. Close the valve closest to the water source. Continue this process, keeping the air moving in front of you at all times. It is important to go through the system manually to make sure any problem is with a part and not the controller.

Crucial steps

Cooper says this process is even more crucial at golf courses because of the large footage and large diameter of the

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THE LEADER IN INNOVATION

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Michael Bravo, Thompson Irrigation, Chino, Calif.

pipes. If the system has a multi-stage pump plan, use only the jockey pump to fill the system. Continue checking each zone through the course. "You must pay particular attention to the peaks and valleys in the system," Cooper warns. "It's the low points where most problems will occur."

As you manually check each zone, first check the master or gate valve to make sure it is working smoothly and freely. Next, check valves, lines and sprinkler heads. Valves and sprinkler heads could have cracked through freeze damage. Or, they could simply need to be cleaned. "There could be dirt on the nozzles," says Bravo. "You might have to take them apart and clean inside the sprinkler head. It's rare, but not uncommon. Out of a hundred you might have to do three or four."

Gary Panuzzi, customer service manager of Richdel Inc. in Carson City, Nev., says sometimes bugs can collect in sprinkler lines and clog them. He says to unscrew the sprinkler heads and let the water clear the lines out.

Heads can also be broken by snow plows hitting them over the winter, says Burkhart. Cooper stresses also to be careful of maintenance work, such as installing phone or power lines, which can damage valves or sprinkler heads.

Broken pipes

Broken pipes, however, present the biggest problems. Loss of pressure in a zone, indicated by heads not popping up properly, or water coming quickly to the surface, indicate pipe trouble.

Be certain to operate the system for a short time to make sure the problem is not a symptom of just being turned on. Also, water pressure changes at different times of the day, says Desi Williamson, district manager for Rain Bird. The best pressure is in the middle of the day when most people are at work and not using water.

It is important to check areas near concrete, particularly in residential systems, because concrete transfers cold and can contribute to freeze damage.

Besides the cost and labor involved in replacing a pipe, the destruction of landscaping in the area of the broken pipe can be an even worse problem. Cooper says some breaks can literally shatter the ground when they come to the surface.

"You can get a lot of erosion and water waste before you get the system shut down and the problem corrected," Cooper says. "Not only that, but digging down to fix the pipe ruins the landscaping."

Doug Miller with Champion Brass in Los Angeles, Calif., says with new products on the market, most irrigation system owners can easily replace valves or sprinkler heads, and many times can even fix a section of a broken pipe.

Williamson says to not forget to check the backflow preventer, which is always located 12 inches above the highest point in the system. The device is designed to keep contaminated water out of the system.

The final step in the process is to check the controller. Again, run through the system zone by zone, checking the electrical signal to each area.

The controller can freeze over the winter. To avoid this, Altum recommends using a controller which can be kept inside over the winter. If this isn't possible, he says, be sure to heat the controller with a lightbulb or heat tape.

In the South...

Irrigation systems in the South which are kept hot in the winter, but not used as frequently, need only a walk-through operational check before going into full swing.

First, check to make sure the valves and sprinkler heads aren't clogged, and that the spray and rotary heads are working right. Finally, check the controller to make sure it is sending the message to the valves to open and close.

Problems in Sun Belt systems should be routine. For irrigation systems which are shut down over the winter, the spring start-up should also be a routine process, provided the system was properly winterized.

If you find yourself repairing a great deal of freeze damage this spring, remember your headaches in the fall when you winterize. Preventative maintenance is the key to a smooth-running system. **WT&T**

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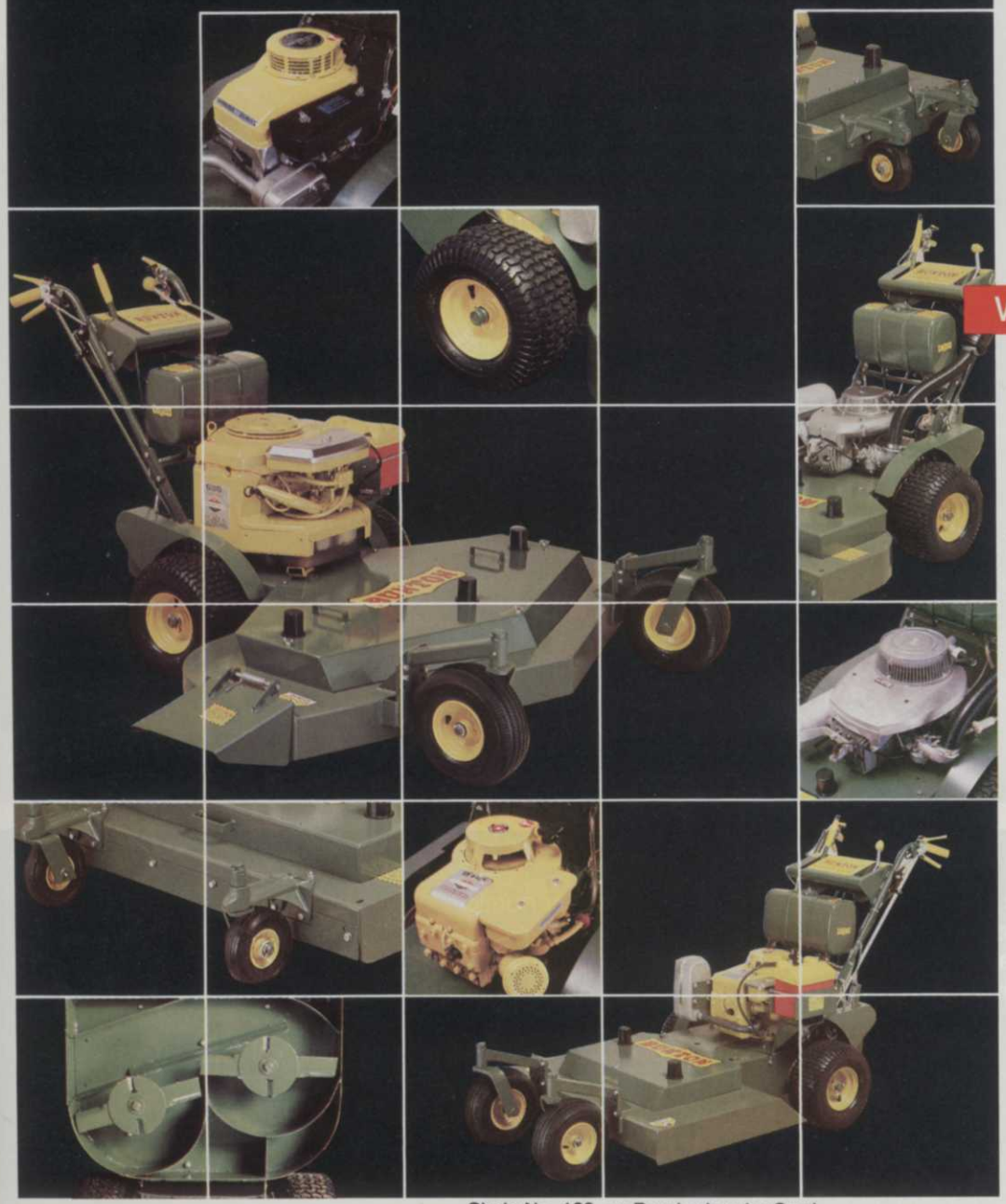

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WATER MANAGEMENT ON COMPACTED SOILS

Dr. Robert N. Carrow, University of Georgia

Foot and vehicular traffic on recreational turfgrass sites often result in soil compaction—the pressing together of soil particles resulting in a more dense soil and less favorable growth medium.

Soil compaction has a major influence on turfgrass water relationships. In fact, many of the injuries enhanced by compaction are water-related—either from water deficits (wilt, desiccation, winter desiccation) or excess water (scald, intracellular injury).

Before we discuss cultural practices to reduce compaction effects, it is important to understand exactly how soil compaction affects turfgrass water relations. Since the most common form of soil compaction on recreational turf is compaction of the upper 1 to 3 inches, that will be the focus of this article.

Other types of soil compaction also occur and present unique problems where cultural approaches are needed to resolve them. For example, a thick compacted zone of 3 to 12 inches near the surface (as occurs from a heavy clay topsoil where equipment runs over the area during construction) presents different problems than a compacted zone of 1 to 3 inches thick that occurs several inches deep in the soil profile (i.e. a plow pan situation).

Soil responses

As the upper 1 to 3 inches becomes compacted, the total pore space decreases and fewer large pores (macropores) remain. Macropores are important for rapid drainage, gaseous movement into and out of the soil, and root channels. More specifically, the following soil physical properties are altered:

1). **Infiltration decline.** With only a few larger pores at the surface, water does not enter the soil as rapidly. This makes good irrigation scheduling difficult, especially during hot, dry, weather. In periods of high precipitation, water collects in low spots or runs off the site.

2). **Soil aeration decreases.** Turfgrass roots cannot efficiently absorb water if soil O_2 is low. Since compaction reduces the volume of large pores that would contain O_2, the O_2 level declines for long periods after saturation by rainfall or irrigation events. The net result is poor root growth, root dieback, low root viability, and poor water uptake.

3). **Soil strength increases.** With fewer large pores, the roots must exert more energy to penetrate the small pore spaces. Also, a dense soil exhibits greater total adhesive and cohesive forces holding the soil particles together, especially as the soil dries. The lack of root channels and a hard soil slow the rate of root extension and cause a shallower root system to develop which limits water uptake.

4). **Moisture retention capabilities of the soil are altered.** The greater number of small pores (micropores)

continued on page 40

Constant turfgrass traffic—a result of games such as soccer—often results in soil compaction.

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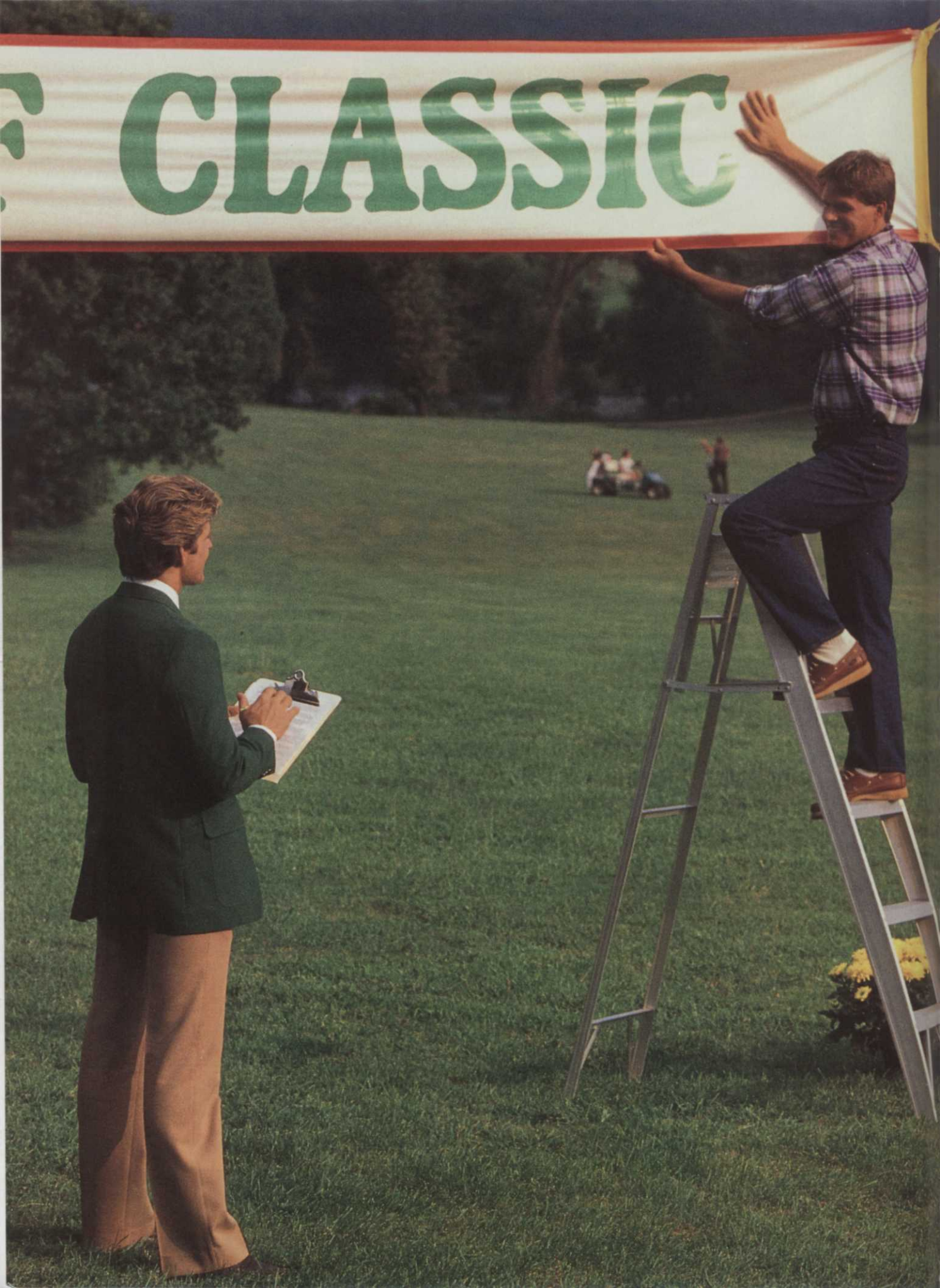
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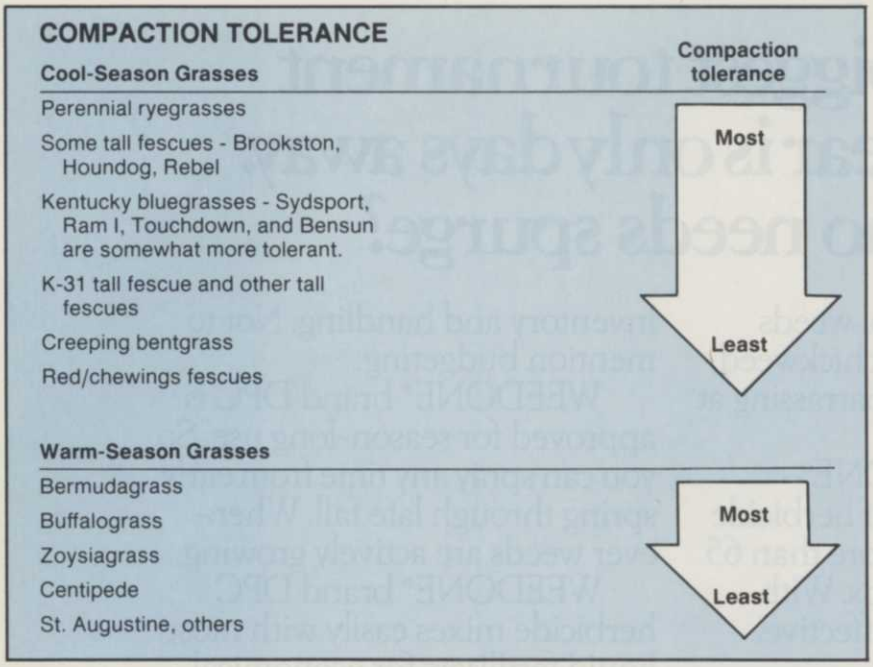

result in more total water retention but the water is often held too tightly by soil particles for plant use. Thus, a compacted soil often has less available water for plants compared to the same soil that is not compacted, especially for loams and clay soils.

5). **Soil temperatures can be altered.** In the spring, compacted soils are usually colder due to their higher total water content. This delays root initiation and slows root growth. During the summer, compacted soils are often warmer due to less turf cover. Drier, compacted soils transmit heat more rapidly than an uncompacted soil. Higher soil temperatures can result in root death, especially on cool-season species.

Plant responses

The less favorable soil physical conditions of a compacted soil soon result in adverse effects on the plant. Plant responses that directly influence water use are:

1). **Root growth.** Compaction influences root characteristics in several ways:

a) Reduced depth and extent of the root system. Deep rooting is important during dry periods. Without deep roots, the grower is forced to irrigate lightly and more frequently.

b) Root viability and longevity may decline. Low soil O_2 can reduce the permeability of the root cells to water movement and result in cell death if the O_2 stress is prolonged.

c) Root tips can increase in diameter due to the hard soil and further reduce penetration into the soil.

d) Root hairs may be fewer in number. Evidence for this is limited, but a reduction in root hairs would greatly reduce total root water absorption.

e) Root porosity increases. Under low soil O_2, root porosity increases, especially if the roots are subjected to wetting and drying cycles. A high root pore space (these root pores allow O_2 movement inside the root) develops from adventitious (secondary) root development in the upper 1 to 2 inches or from breakdown of cell tissues. Oxygen moves from the atmosphere into the root and alleviates the O_2 stress; thereby, increasing the ability of the plant to extract water under low soil O_2 levels.

The net effect of these root responses is to limit the volume of soil for water uptake and to reduce the ability of the root to take up moisture during wet soil conditions.

Thus, whether the soil moisture status is wet or dry, compaction reduces water uptake. The beneficial response of greater root porosity aids in increased water uptake but only to a limited extent under very low soil O_2 (i.e. saturated) conditions.

2). **Shoot morphological responses.** A number of shoot morphological (structural) changes occur under compaction that influence water use of the plant. These include:

a) Decreased shoot density. Turfgrasses produce fewer tillers, rhizomes, and stolons under adverse growing conditions. This results in less total leaf area for transpirational water loss. However, with greater solar radiation reaching the soil surface, evaporational losses from the soil surface may increase. This could be a substantial loss of water if the grower is irrigating frequently.

b) Rate of leaf extension is reduced. The leaves grow at a slower rate and this reduces the amount of leaf area that could result in water loss.

c) Stomatal numbers may decrease. Since transpiration occurs through the stomata, a reduction in stomatal numbers would reduce water loss (i.e. stomatal resistance increases).

d) The actual structure (leaf numbers and leaf orientation) is altered with a more open canopy. This would imply that canopy resistance to water loss into the environment would be less. Thus, water should be lost more rapidly, especially by evaporation.

The total effect of these morphological responses is to reduce water use (i.e. water needs) of the turf plant grown under compaction.

However, if a grower is applying water on a low volume, frequent application basis (in response to low soil infiltration and a limited root system), the reverse can be true: evaporational losses become so high that total water use increases over what an uncompacted grass would use. The increased water use results from greater evaporational losses rather than transpiration needs.

3). **Shoot physiological responses.** Compaction may result in certain physiological responses that would affect water use, such as:

a) Leaf water potential is lower for grasses grown under compacted conditions. The reason for this response is not clear but this should reduce transpirational water use.

b) Stomatal diffusion resistances are higher, probably due to the lower leaf water potential and fewer stomata. This would decrease transpiration at any particular soil moisture level.

c) Canopy temperatures are 1 to 3° C. higher under compaction. The higher temperatures would result from increased stomatal and closure reduced efficiency in soil water uptake by the roots. With higher temperatures, evaporation and transpiration increases.

d) Drought hardiness may decline due to a more succulent turf (if frequently irrigated) and lower total non-structural carbohydrates. Drought hardiness does not directly influence water use, but is important for plant survival during drought stress periods.

It should be clear that many factors (soil physical properties, root and shoot morphological, and physiological factors) may affect water use of grasses on compacted soils. While the grass plant uses less water under com-

continued on page 40

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pacted versus uncompacted conditions, the grower often finds it necessary to irrigate with low quantities of water on a frequent basis. This type of irrigation regime greatly increases evaporational losses and, therefore, total water use.

Cultural practices

If the soil and plant effects of compaction are alleviated or reduced, then water management problems are improved. Several approaches are possible. The grower should use a combination of cultural practices because no single approach, except total soil modification, will resolve the problem.

1). Use of species/cultivars adapted to your climate, pest stresses, use, and cultural level is important. Compaction makes the turf more susceptible to other stresses and reduces recuperation once injury occurs. By limiting other stresses, soil compaction problems are less frequent.

After the above selection criteria are used, the grower can determine if a particular species or cultivar is more tolerant to compaction than another and use the tolerant grass. Limited information is available on specific compaction tolerance of species and cultivars but the list contained herein summarizes current information.

2). Traffic control to minimize compaction is another approach. This may take several forms such as:

- using alternate practice fields;
- moving around the total area of a football field during practice;
- limiting traffic on excessively wet fields;
- limiting band practice on the main field;
- using larger greens and tees;
- more frequent movement of tee markers and flags on greens
- cart paths; and
- careful design to prevent excessive traffic areas.

3). Cultivation to provide openings for water infiltration, gas exchange, and root channels is a major means of reducing compaction effects. Generally, a program should be developed using one or more cultivation techniques and possible topdressing with sand. Core aeration is especially effective but other methods can be useful—slicing, grooving, spiking, forking, shattercoring, deep core aeration, and sub-aerification.

4). Other management programs should be adjusted to allow for the best growth. For example, high levels of nitrogen (N) on compacted turf can restrict rooting even more than compaction or high N alone. Good surface and subsurface drainage should be developed. A good pest program to control diseases (brown patch, pythium) and weeds (knotweed, goosegrass, Poa annua) that are problems on compacted sites should be formulated.

Irrigation scheduling is worth particular attention, and every effort should be made to irrigate as deeply and infrequently as possible. Practices to improve soil infiltration and to develop deeper rooting will allow for such an irrigation approach.

The grower should remember that the use of a low volume, frequent irrigation schedule is the primary reason for excessive water use under compacted soil conditions.

5). Chemical soil modification may provide some help in specific situations. Gypsum can assist in promoting a better structure on heavy, salt affected soils. However, remember that even naturally well-structured soils succumb to compaction if the traffic is severe enough. Sometimes chemicals have been used to stabilize a soil structure. Examples include polyvinyl alcohols, polyacrylamides, and various algae-based polymers. These products stabilize the existing structure but structural units can still break down under compaction. Wetting agents have been used to improve drainage of compacted soils but research evidence for their use is limited and conflicting.

6). Physical soil modification can effectively reduce the potential for compaction. Partial modification by the addition of sand or organic matter to a heavy, clay soil can be useful if the proper proportions and materials are used. Organic matter contents up to 15% are normally used but a total sand content of 85% or more may be more effective. Complete modification is an alternative to partial modification if intensive traffic is expected. The USGA Green Section specifications, the Purr-Wick, and the PAT systems are all effective for golf greens and athletic fields.

7). The paver system is the last approach. Many of these systems have a concrete or plastic matrix to withstand traffic with some openings for grass to grow. For cart paths and parking areas, this can be a good approach. The ultimate "paver" is artificial turf.

Certainly a compacted soil presents a severe challenge to good water management. But if the above cultural approaches are utilized, compaction will be reduced and as a result, water management will improve.

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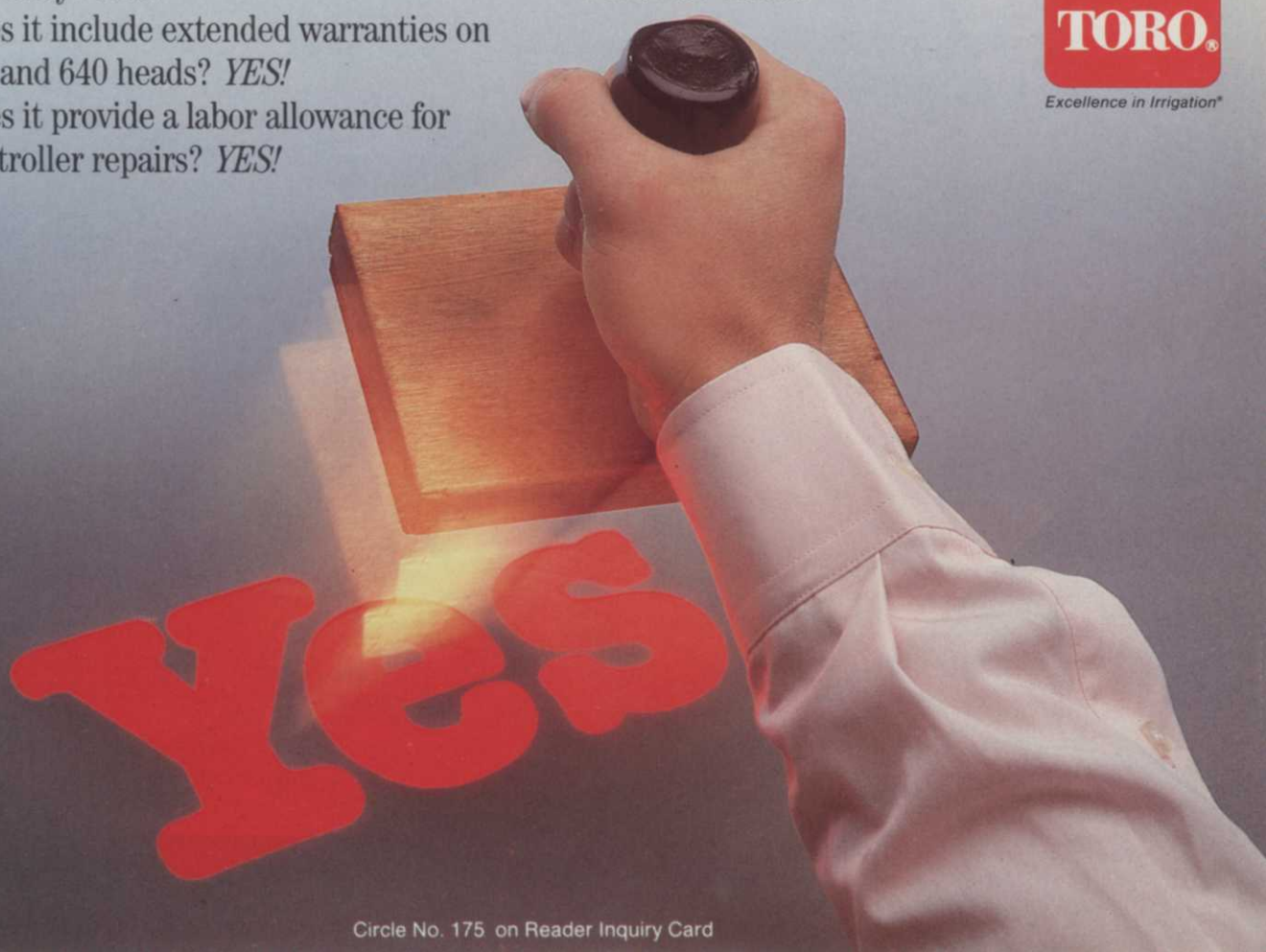

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DUTCH ELM DISEASE

Your elms have it, you don't know how to treat it. Though there's still no sure cure, there are treatments that can help the fight.

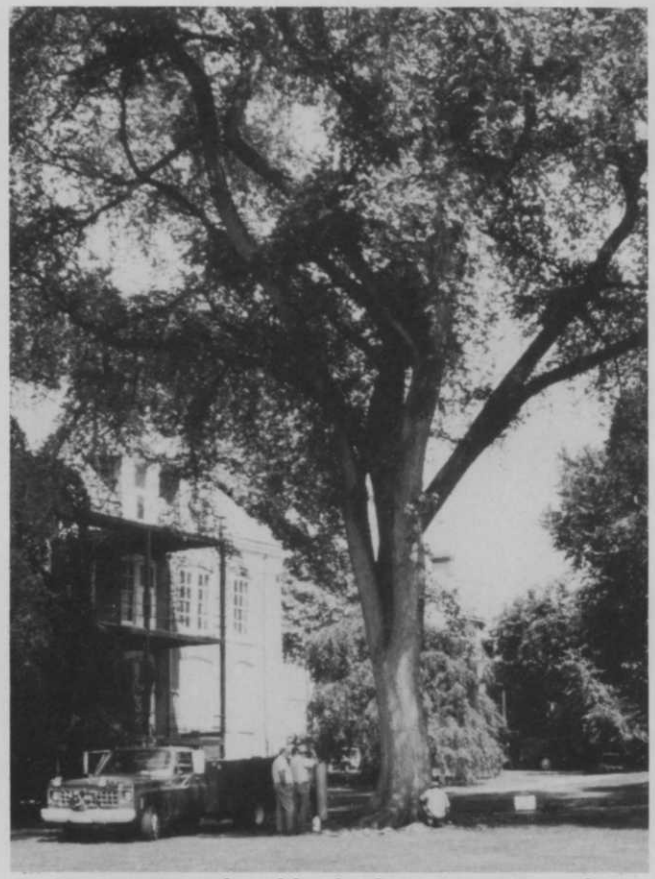
by Roger K. Bowman, grounds supervisor, University of Delaware, Newark, Del.

Deciding how to set up a tree care program, or any grounds maintenance program, has to be a matter of economics. In the case of Dutch Elm Disease (DED), the economic problem many companies face is often limited to calculating the cost in removing dead trees, because there has not been an effective treatment program.

Today, despite attempts at remedies, there are still just three basic ways to treat the problem.

First, there's a do-nothing program, where you simply let the disease run its course, and remove trees as they die. While this might appear to be the cheapest way to go, a closer look at the costs may be revealing.

The minimum cost of removal is around $500, more likely in the range of $500-750. If the tree is in a difficult location—near buildings, power lines, or other structures where removal is complicated—then costs can easily run to $1,000 or more.



Saving American elms, like this large specimen and more than 100 on the University of Delaware campus, is one goal of the plant operations department.

Then there's the additional cost of losing a tree whose value may be considerable, depending on its size, shape, and location. The loss of a mature elm with a classic shape in a desirable location could be as much as $10,000, using the estimating procedure outlined in the "Guide for Establishing Values of Trees and Other Plants," from the International Society of Arboriculture.

Minimum control

A step up is a minimum control program, where dead wood is removed on a regular basis to, 1) minimize spread of the disease, and 2) eliminate breeding grounds for the elm bark beetle that carries the fungus on its body from infected trees to healthy ones.

In tree removal and in pruning dead wood, destroying the wood is extremely important, again to eliminate homes for elm bark beetles and larvae.

Along with deadwooding, a minimum control program should include injections with a fungicide, to control *Ceratocystis ulmi*, the fungus that causes the disease. One of the two fungicides labeled for DED is Arbotect 20S. Although this product was first introduced in 1977, a recent approval for a three-season rate, based on new research at the University of Minnesota, and a new injection technique, have made it more effective.

The product plays a significant role in the third option: a complete tree care program that includes sanitation and inspection, controlling beetles, and planting trees to replace earlier losses.

The elm bark beetle

In early spring before the growing season begins, one should reduce beetle populations by spraying trees with an insecticide. A second spraying in summer prevents beetles from eating the leaves.

Trucks with elevated platforms are recommended to reduce the spraying distance by 50 feet and to reduce the amount of material needed by 50 percent or more.

At the University of Delaware, we participated in a research program (1975-80) on trapping elm bark beetles, developed with the assistance of Dr. Jerry Lanier at Syracuse.

When the project ended, the traps were not available for a couple of years. We relied on our spraying program and elimination of breeding sites.

From 1980 to 1983, we saw a significant increase in the number of trees lost to DED. Losses were less than 5 percent during the time beetle traps were used, and it jumped to more than 10 percent when traps were eliminated. Fortunately, the traps did become available commercially.

Besides spraying, sanitation and inspection are a central part of some elm tree care programs. Sanitation involves deadwooding (removal and destruction of dead and dying elm wood).

Trees shouldn't be pruned during growing season, because beetles are attracted to the cut areas. However, any dead trees, and dead or dying branches on healthy trees, should be removed and destroyed, to eliminate both breeding sites for elm bark beetles and reservoirs of infection for the disease-causing fungus.

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84-45

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After soil has been removed to expose root flares all around the elm, university grounds crew members Douglas Lanham (right) and St. Clair McVicker drill holes and tap in injection tees. Tees are connected by tubing that connects to the tank containing fungicide mixed in the required amount of water. The fungicide is injected into the tree at 5-15 psi.

Tools are sterilized with a product like Lysol between each use to avoid transmitting the fungus between trees.

Inspection programs should be most intensive during the growing season, when trees should be watched daily for signs of "flagging," where a branch of the tree dies above a spot where beetles have been feeding, and the yellowing or dead leaves stand out like a flag amid the healthy green leaves.

If a dead branch is spotted, remove it immediately and make a visual check for infection. Peel back the bark. If the wood shows dark streaks, the disease is present. If there is doubt, you may want to send a sample to the county agricultural extension service to determine whether the branch died from the fungal disease.

A three-year rate

Success against DED can be achieved using Arbotect fungicide injections at a three-year rate. Trees are injected at three times the normal dose, and then not treated for the next two years.

This new method also involves excavation around the trunk and injecting into root flares using injection tees fed from a pressurized tank at 5-15 psi, rather than by gravity feed into tees placed above ground in the trunk itself.

At the University of Delaware, we tested the method on six trees, two trees at a time. We saw no signs of flagging or other problems. A three-man crew, injecting three times a day, completed 44 of the most desirable trees, based on their shape, size, and location.

We found it best to divide elms into three classes and treat each class for one year. After three years, the first group will be ready for re-treatment.

Treating at three times the rate, but having to do it just every third year is advantageous from several points:

- It provides better protection because the fungicide moves into the new wood of the tree from year to year when used at the three-year rate.
- It's less damaging because there's no digging and drilling holes every year, so the tree has more time to recover.
- And, it clearly saves money.

For example, cost to inject 44 trees (labor, water, and fungicide) is about $7,400 or about $170 per tree. Prorated over three years, that's less than $60 per tree. Saving a tree looks like a bargain, compared to the minimum cost of removing a dead tree.

Additionally, with expensive replacement, one must wait years for a young tree to develop.

A small four-inch diameter tree, including planting and a one-year guarantee, costs about $1,200.

As further protection, you can also use chemical treatment in the soil to prevent root grafts between affected and healthy trees. Root grafts also can be controlled by cutting a trench about 18 inches deep between trees and severing any connecting roots. (In some areas, this technique can't be used because of so many underground utilities.)

Community checks

For further control, you might consider extending tree inspections into the community, both for homeowners and municipally-owned trees which might be afflicted with DED. If so, homeowners or city workers should be advised to contact a professional arborist.

It should be pointed out that chances of saving a tree with 10-15 percent of the crown affected are only fair, so the owner should consider whether to try to save it, and what the tree's appearance will be after removing the diseased sections.

If flagging is between 5-10 percent of the crown, chances are good, and 5 percent or less, then there's an excellent chance of saving the tree.

In all cases, you need 10 feet of uninfected wood below the cut you make to remove diseased portions. Then continuing care must always be performed. **WT&T**

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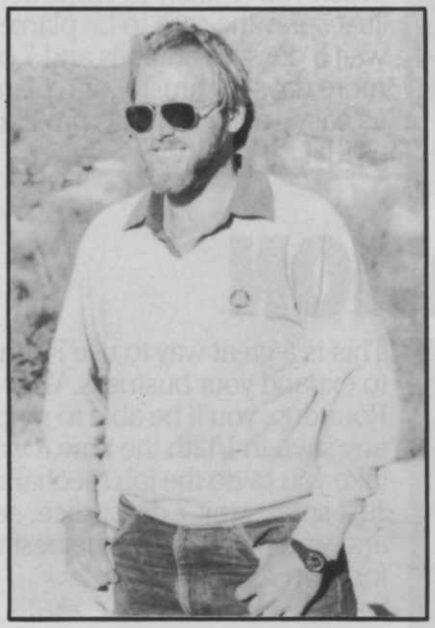
A STAR IS BUILT

It doesn't look like much now—just rock, dust, and hills. By October, Star Pass TPC in Tucson will play host to its pro golf tournament.

by Ken Kuhajda, managing editor



If brown is your color, you may want to go to Tucson, Ariz. But you'd better hurry.

That's where Star Pass Tournament Players Club will soon be rising from the rocks that dominate the southeast Arizona landscape.

Star Pass, its ground broke in April 1985, doesn't sport any green.

The brown of the desert and hills of west Tucson dominate. Today, Star Pass doesn't look much like a world-class course. It will soon.

If all goes as planned, Star Pass will host the Tucson Match Play tourney this October.

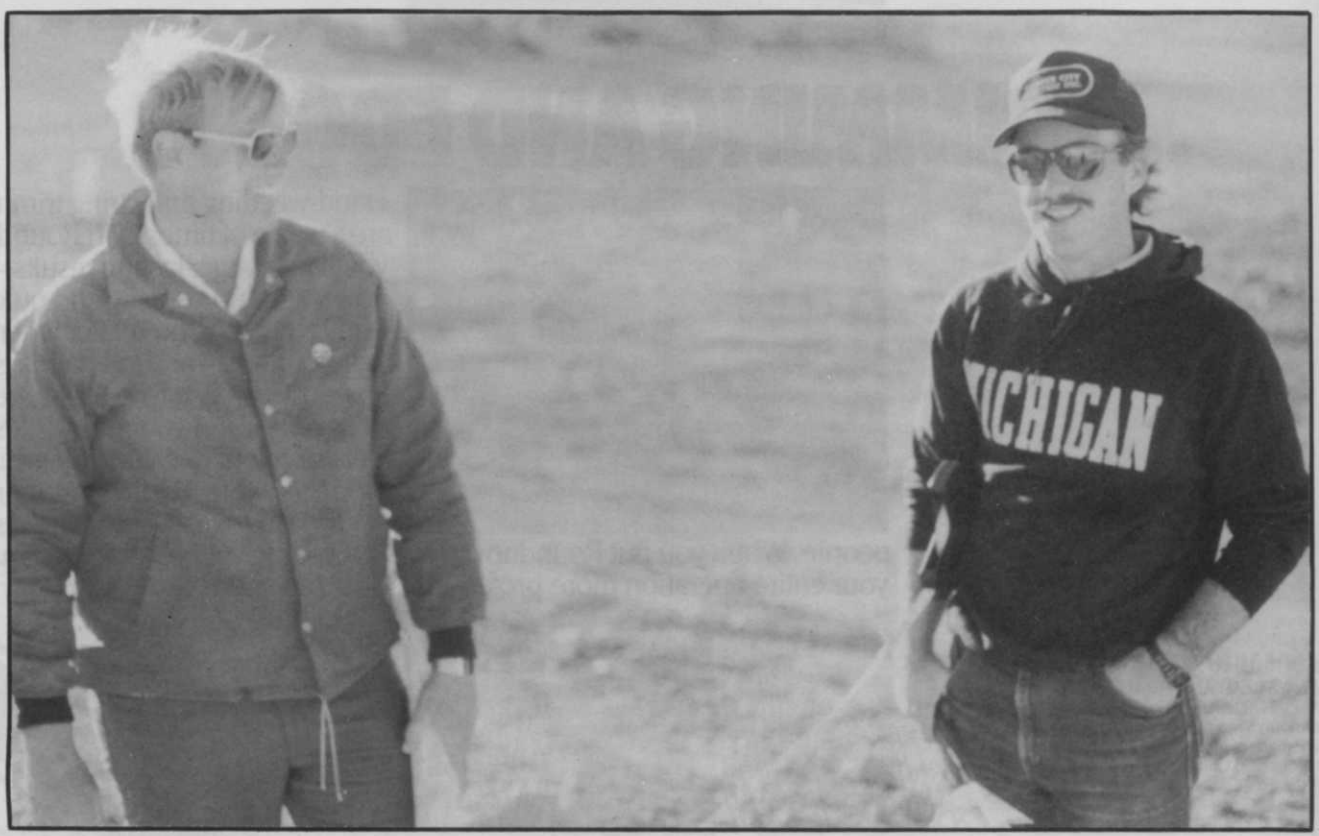
By then, course superintendent Harold Vaubel *prays*, the tees, fairways, and greens will be a lush green.

Star Pass, one of a growing list of TPC-owned and operated clubs, will add to Tucson's list of new and impressive courses.

Building on rock

Most likely, the Wadsworth Golf

Below, superintendent Harold Vaubel (left) and Wadsworth Golf Construction superintendent Kevin Sutherland. Top left, assistant superintent David Michael. Near left, irrigation trenches are carved.



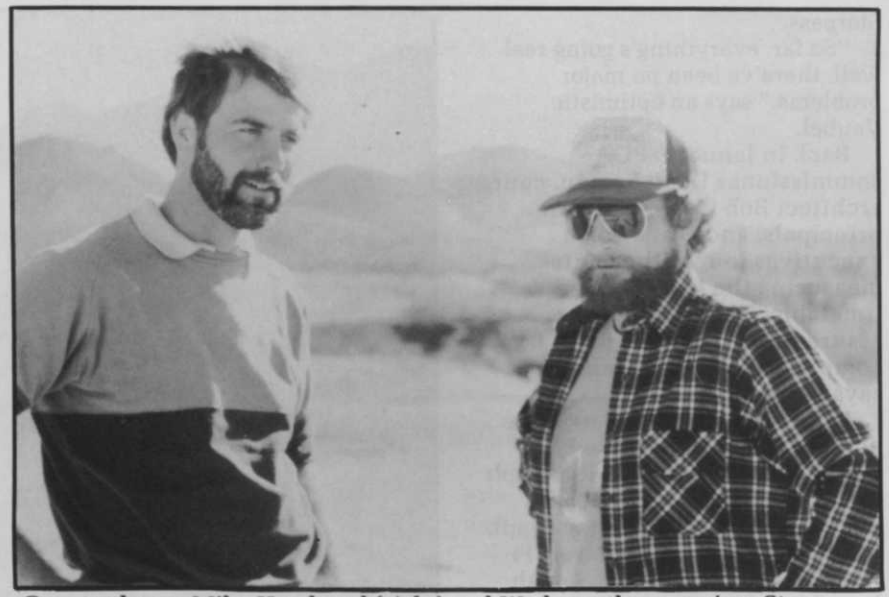
Construction Company, Star Pass builders, took a peek at the planned site and brought along extra dynamite.

The terrain has not made the job easier for Wadsworth job supervisor Steve Robison, who has been on the site since groundbreaking.

"This has not been an easy job to work because of the rock," says Robison. His co-worker, greens shaper Mike Hatchcock, agrees. "I can verify that because of my back," he says with a smile.

By the time Wadsworth finishes, they will have seeded bentgrass greens, and stolonized bermuda 419 fairways and bermuda 328 tees.

Then it's up to Star Pass superintendent Vaubel and crew to nurture hybrid bermuda, common bermuda, bentgrass, and desert vegetation that will lie on the course's 120 acres.



Greens shaper Mike Hatchcock(right) and Wadsworth supervisor Steve Robison take a break at Star Pass.

How to build a course

In the last year Wadsworth has:

- staked fairways and cleared vegetation. Some vegetation, such as the saguaro cactus, was held for later placement (Arizona law says you can't kill several desert plants, including the saguaro cactus, many of which are well over 100 years old).
- shaped fairways, in the process, dynamiting the impeding rock.
- performed all drainage work and installed the irrigation system.
- reshaped and removed all excess rock, backfilled the trenches, and then reshaped the course again.
- performed prep work for the topsoil. They then placed top soil layers of up to 6 inches over the course.
- prepped the greens, beginning with drainage tiles, a 4-inch gravel blanket, a 2-inch course sand blanket (choker layer), and a 10-inch greens mix comprised of fine sand with organic matter added (in this case, 20 percent Canadian peatmoss).
- seeded the greens, sodded the green slopes and bunker slopes, and stolonized the fairways and tee tops.

Wadsworth, no stranger to building golf courses in Arizona, has also enhanced the natural mounding that the TPC requires for a stadium golf effect.

They've also left room for underground utility cables. None will be above ground.

Wadsworth has 32 employees on site, including three shapers and 11 operators. The company should be off-site by early May.

Arizona has become a sort of second home to some Wadsworth employees. Construction superintendent Kevin Sutherland, a Michigan native, has spent the last three years in Arizona building new courses.

Among those: Desert Highlands, La Paloma, and Ventanna Canyon.

A good opportunity

Assistant superintendent David Michael, 28, is working on his third under-construction course. That's what superintendent Vaubel was looking for in an assistant super: someone with construction experience.

Vaubel had previously served as superintendent at Albuquerque Country Club and Desert Forest Golf Club, and assistant superintendent at Tucson National Golf Club and Goodyear Golf and Country Club.

Michael, formerly superintendent at La Mariposa Sports Club in Tucson, says working for the PGA represents a "challenge and a good opportunity."

As he tours the course, Michael seems to know every hill, every swale. The new course has become his friend.

"With the PGA, the number one concern is quality," he says. "With the pros, the quality of their game is number one and so is the quality of their courses."

Michael, who gave up a career in electrical engineering after his junior year in college, obtained his agronomy degree from the University of Arizona.

Trodding golf courses since age six, Michael has no regrets. He's living his desire.

Vaubel and Michael will employ an 18-man crew at full strength.

The only other employee at this time is head mechanic Al Fleming, a former staffer at Tucson Country Club.

Water, water, water...

After Wadsworth clears out, Vaubel and Michael will begin nurturing the baby turf to life.

It's going to take a lot of care. Semi-arid Tucson gets only 11 inches of rain per year. Irrigation with effluent water (state law prohibits irrigation with potable water) will be ongoing, perhaps as much as 10 to 15 minutes per hour.

The 100-degree heat of the average Tucson summer, coupled with bentgrass greens, will provide a challenge for Vaubel and crew. The fairway and tee bermudagrass should prosper.

By early fall, says Vaubel, the course will be in shape for the 500 or so members the developer, Uniwest, hopes to draw.

In addition, the hilly surrounding areas will be bustling with construction of houses and condominiums. Uniwest is developing some 800 acres at Starpass.

Starpass.

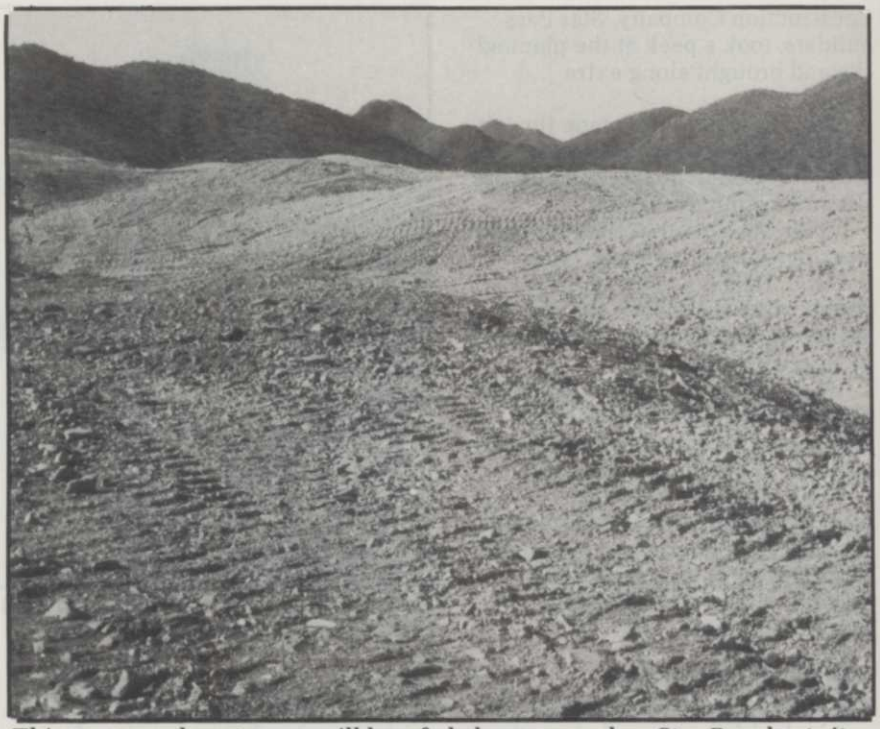
"So far, everything's going real well, there've been no major problems," says an optimistic Vaubel.

Back in January, PGA commissioner Dean Beman, course architect Bob Cupp, Uniwest principals, and Wadsworth executives toured the course, measuring the construction timetable. They came away assured that the course will be completed by tournament time, says Vaubel.

"They said that Star Pass is the number one priority of the PGA," says Vaubel. Just in case, Randolph Golf Course in Tucson has been lined up as a back-up for the event.

Currently the PGA controls 14 courses throughout the U.S. with four slated for opening in 1986. Each year four more are slated to open.

Star Pass, barring unforeseen disaster during the August "monsoon season" (what residents call the rainy period), should be ripe come October. **WT&T**



This common desert scene will be a faded memory when Star Pass hosts its first pro tournament this October.

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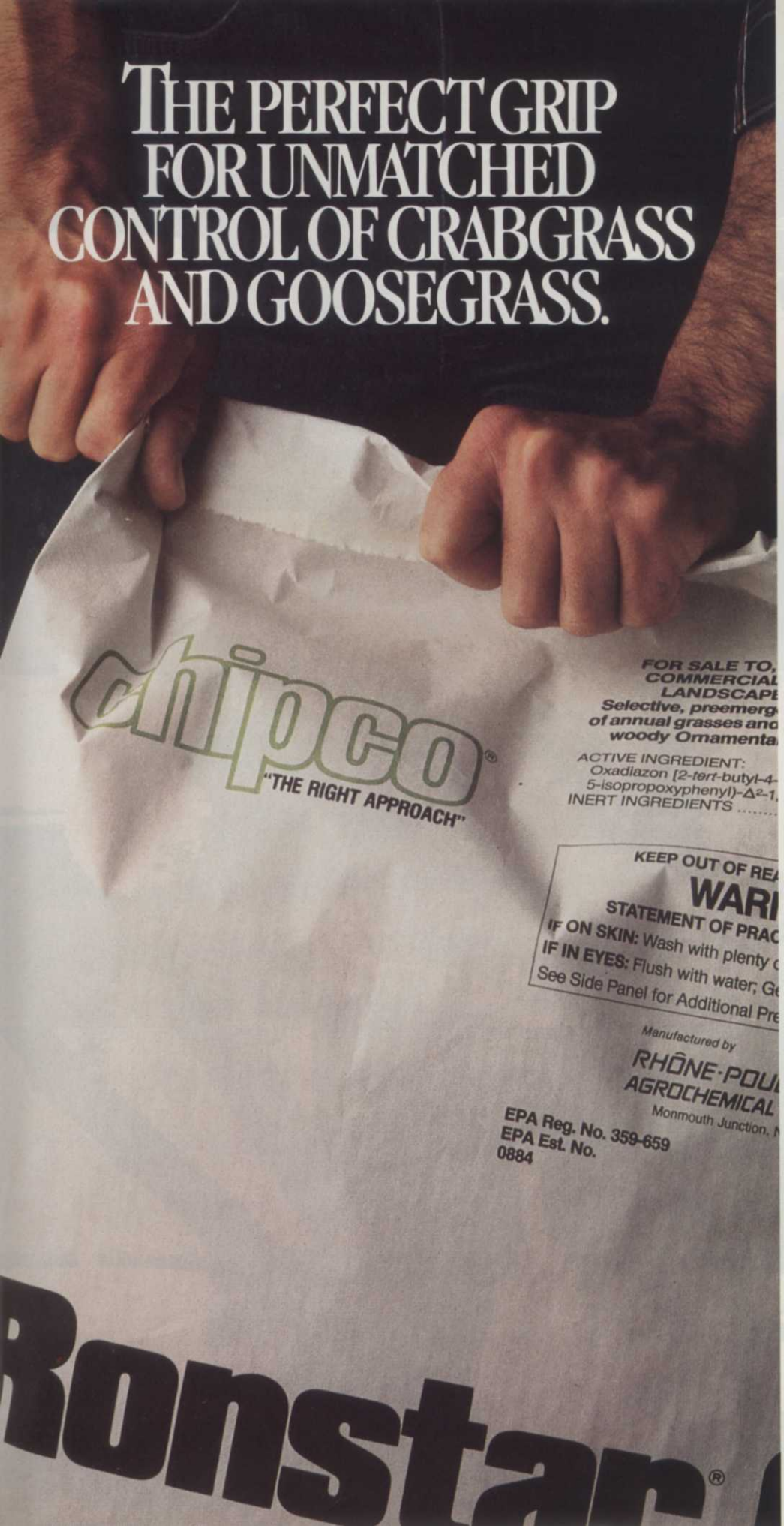

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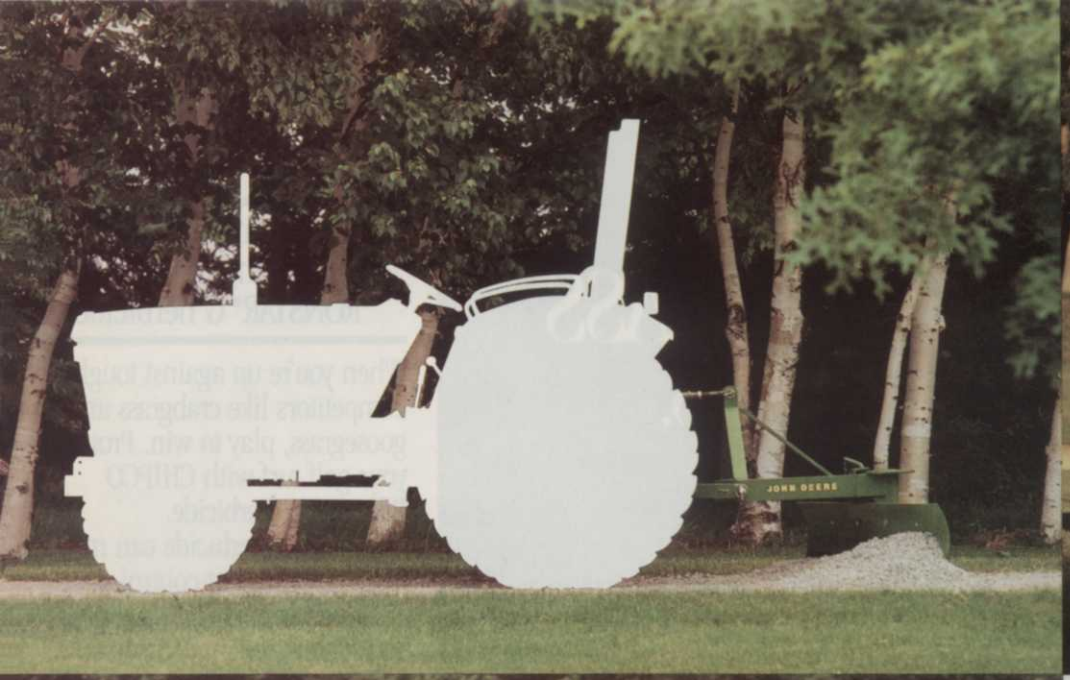
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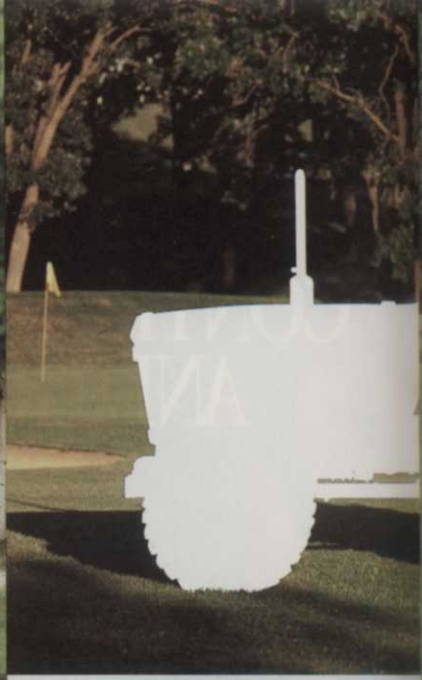

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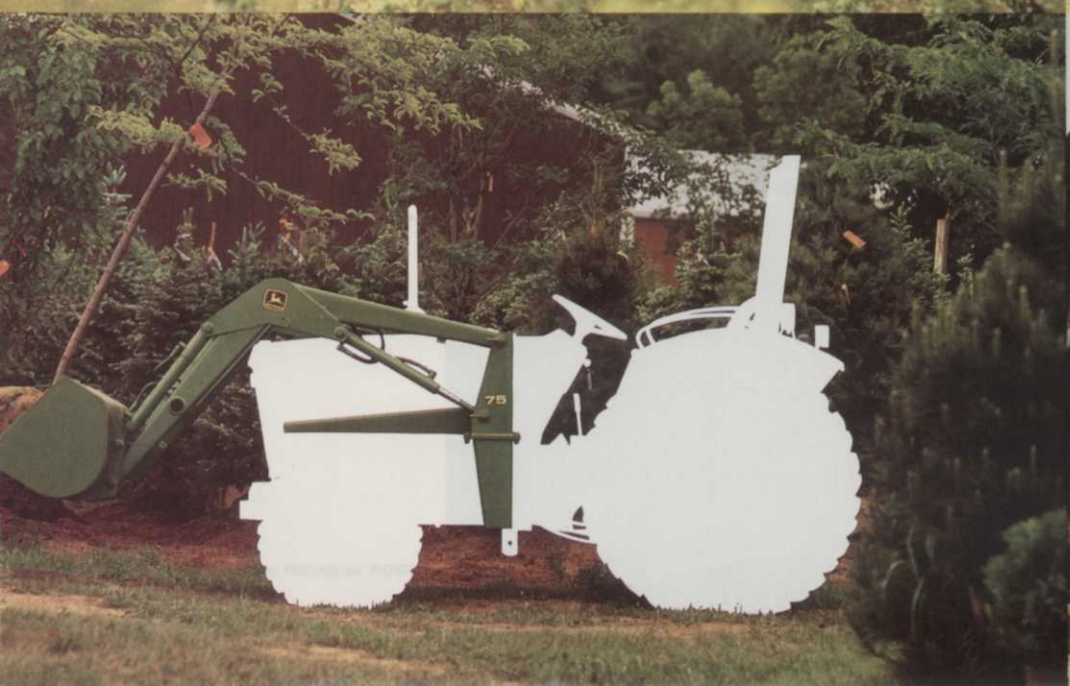
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WEED BUSTERS

Two Virginians approach the chemical spraying business differently. They go for the industrial and commercial accounts, those who usually don't use the custom applicator for weed control.

Lyle Anderson and Dave Schoonover developed a new market while starting a spray business last year.

"Our business came from an increased piece of the market pie," says Schoonover. "We picked up 150 industrial and commercial accounts. Ninety-eight percent never before had hired a custom applicator to kill weeds."

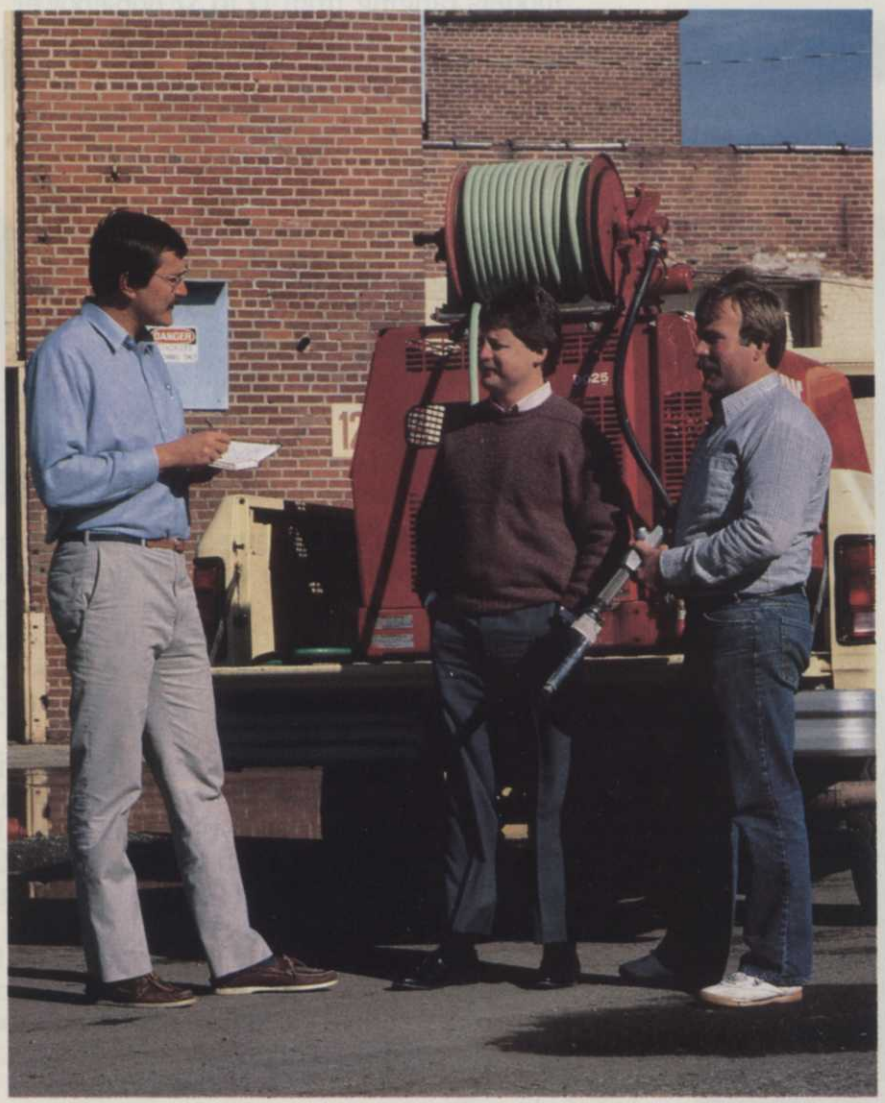
Says Anderson, "When I wasn't spraying, I was selling. We decided we didn't like to drive by potential new business."

Where do they find this new business? "Practically any operation with a gravel lot or storage area," says Anderson. "We look at warehouses with surrounding areas prone to weeds, firms with outside storage areas, steamline companies, pipeline companies, property management companies, major manufacturers, utilities, and wood preservation firms."

Adds Schoonover, "We'll be developing lots of these and others similar to them in 1986. We are going from our one rig operation to three units. We'll triple our number of accounts."

Incorporated in 1985, Custom Weed Control operates within a 65-mile radius of Roanoke, Va.

"The potential is enormous," says Schoonover. "Keeping down weeds is not just for aesthetics. The practice has dollar value, though the aesthetics do constitute a value by improving the image of the business to a customer. Our customers are finding lots of additional economic values."



Dave Schoonover (left) and partner Lyle Anderson (right) talk with Larry Sharpe, northeast marketing manager at Forshaw Chemicals.

More workable areas

He says Custom Weed Control cleaned up an auto salvage firm at less than $1 per car and made the area workable. "Employees not only find it easier to spot a designated model, but can pull parts without competing with a flourishing weed crop."

Partner Anderson stresses further that gravel storage areas, once overgrown, have to be mowed or dug up—unless the weed crop is killed out by chemicals.

"Weed encroachment carries soil and these areas quickly require more gravel. Chain link fences deteriorate more rapidly when overrun by weeds. Fences free of weed growth are not as prone to rust," he says.

The business fulfills a dream for the partners. Schoonover and Anderson, veterans of custom spray operations, both hold business degrees and wanted to use their experience with their own firm.

"Our goals the first year (1985) were to determine which market areas were available to us, the most effective equipment and products to use, develop new business, and operate at a profit. We feel we accomplished these goals," says Schoonover.

Market saturation

Initial business was sold by developing a mailing list of prospects

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from many sources—Chamber-of-Commerce, trade magazines, and business and industrial directories.

Direct mail, complete with a return reply card, was followed up by a phone call. Personal sales calls were the next step.

"We wanted market saturation—not a job here and there. As a result, we have many small, standard-size accounts plus some major manufacturing firms and electrical co-ops," says Schoonover.

"We needed an effective product and we needed a system," he continues. "We leaned on distributor and company representatives and they came through.

One herbicide, Arsenal, has worked well for Custom Weed Control. Schoonover says, "We needed a post-emergence product because, early on, our customers—new to chemical weed control—had to have weed problems and the promise of bare ground control before we could sell the job."

First-time customers are informed that total kill with Arsenal takes about a month. The customers are appraised of each time, thus giving them an education in weed control.

The partners say more than hard work is needed to begin this kind of business. They cite the need for effective products and equipment, and the right kind of on-the-job company support.

Long-term clients

The partners see their business as an annual service. After the first year of cleanup, they write a yearly maintenance contract. "We want total customer satisfaction, and we expect most every account to be a repeat customer," Schoonover states.

To both partners, image is important.

Company shirts and uniforms are standard. After every job is assessed and customer satisfaction is assured, a thank-you note is written to the customer.

Also, for keeping customers appraised of results, and especially for selling new accounts, a before and after photo record is kept of every job. These photos are kept in a binder and used for every call relating to new business.

A great help in this first year of business has been off-season demand for their spray rig as a power washer. With major flooding in the fall of 1985, they ran 12-hour days helping clean up warehouses. A crew with industrial squeegees accomplished the task much faster with help of the power washer.

Another factor that builds customer confidence is the use of a spray pattern indicator, a blue colorant tank mixed with the spray.

"We use eight ounces of colorant per 100 gallons of water," says Anderson, "and customers can see immediately that we have provided thorough coverage."

The entire sprayed area temporarily carries a blue haze cover and is easy to see.

"We save chemical because we don't overlap, and skips are easy to spot, reducing our retreatment cost. We have a saying, 'If it's blue, it's dead,'" says Anderson. **WT&T**

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Take our famous homogenous granules, for instance. Each contains a special chemical combination of nitrogen, phosphorous and potash, plus secondary and trace elements. So every plant comes into contact with every vital element, plus you get more even plant-food distribution, more economically.

Our sulphur-coated urea blends, on the other hand, let you custom-tailor a lawn care program to meet your customer's needs. You can control the time of greening, as well as the length, to keep profitability at a maximum.

Quick green up...extended feeding.

The secret is our exclusive "C.I.L. Prilled S.C.U." Its consistent, round granular size results in a more even breakdown of nitrogen, plus you get a high sulphur content. Your customers' lawns show lush results fast—and stay green for as long as 3 months or more!

No turf is too tough for Lebanon's products.

We have more than three dozen standard fertilizer, sulphur-coated urea blends and fertilizer/chemical control products to solve just about any turf problem. But soil conditions vary, and so do your customers' requirements. Just tell us what you need, and we'll be happy to put our more than 35 years' experience to work to meet your needs. We can formulate an exclusive blend just for your company that will coax the kind of turf you want, when you want it.

Service that's ahead of the competition.

It can help put you ahead of your competition, too. From custom-designed turf care programs to a solid nationwide distribution network, **Lebanon** can assure you of knowledgeable, prompt service. And our entire range of proven top-performance products are developed to help you give your customers better lawn care where it counts. From the ground up.

Call us today...and start getting what you need.

We'll send you a free copy of our agronomy manual at no obligation. And we'll tell you how we can start giving you and your customers better quality turf from the ground up. Call our **Greenline** today at 1-800-233-0628; in Pennsylvania, 717-273-1687.

The GREENLINE

Lebanon

TOTAL TURF CARE

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Give us your tired, your grasses yearning to gro Yes, even your fairways.

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But can you afford to keep your fairways as clean and green as your tees and greens? You can with economical ®BAYLETON Turf and Ornamental fungicide.

BAYLETON is absolutely the most economical fungicide you can use. With its lasting residual, up to 30 days and longer, you make fewer applications. And that saves you time, manpower, and money. Plus, BAYLETON is now available at an attractive new price. For control of dollar spot, anthracnose, and other diseases, there's nothing more effective, or cost-effective, than BAYLETON.

Tee to green and every inch in between, keep your golf course fungus free. With BAYLETON. Always read the label before use.

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IT STOPS THE SPOILERS.

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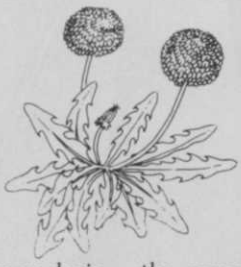
WARM-SEASON TURF

by Ray Dickens, Auburn University, and Euel Coats, Mississippi State University



Weeds are a fact of life. No turf or landscape will remain weed-free without man's intervention. Landscape exposed to heat, drought, poor soil, shade, and traffic will surrender to weeds. That's why there will always be work for the landscape manager.

His job is to shift the balance in favor of the desirable species and keep it that way. He does this by putting stress on weeds and reducing stress on desirable plants.

Stress may stem from poor soil; excessive shade, slope, moisture, and wind; improper plant selection; and maintenance practices such as mowing too low, using unnecessarily heavy machinery on turf areas, over-irrigating, over-fertilization and mis-timed aerification.

Correction of stress factors is an important component of a weed control program. If stress can't be corrected, stress-tolerant plants should be selected and planted.

In this guide, weed control is divided into four categories: turf (warm and cool season), ornamental, rights-of-way, and aquatic.

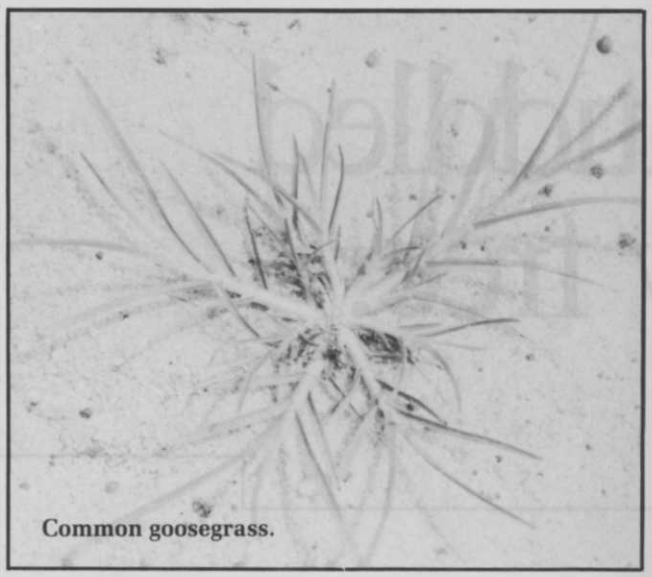
Each area may require a different approach, though many of the chemicals and weeds are the same. It's important that a landscape manager approach each in the proper way.

Editor's note: Throughout the sections of the Weed Control Guide, there are references to herbicides that the authors say have been shown to be effective in combating a certain weed problem. The herbicides labelled as effective are not endorsed by WEEDS TREES & TURF. They have been shown to be effective in research experiments.

The common chickweed.

The Virginia buttonweed.

The yellow woodsorrel.



Common goosegrass.

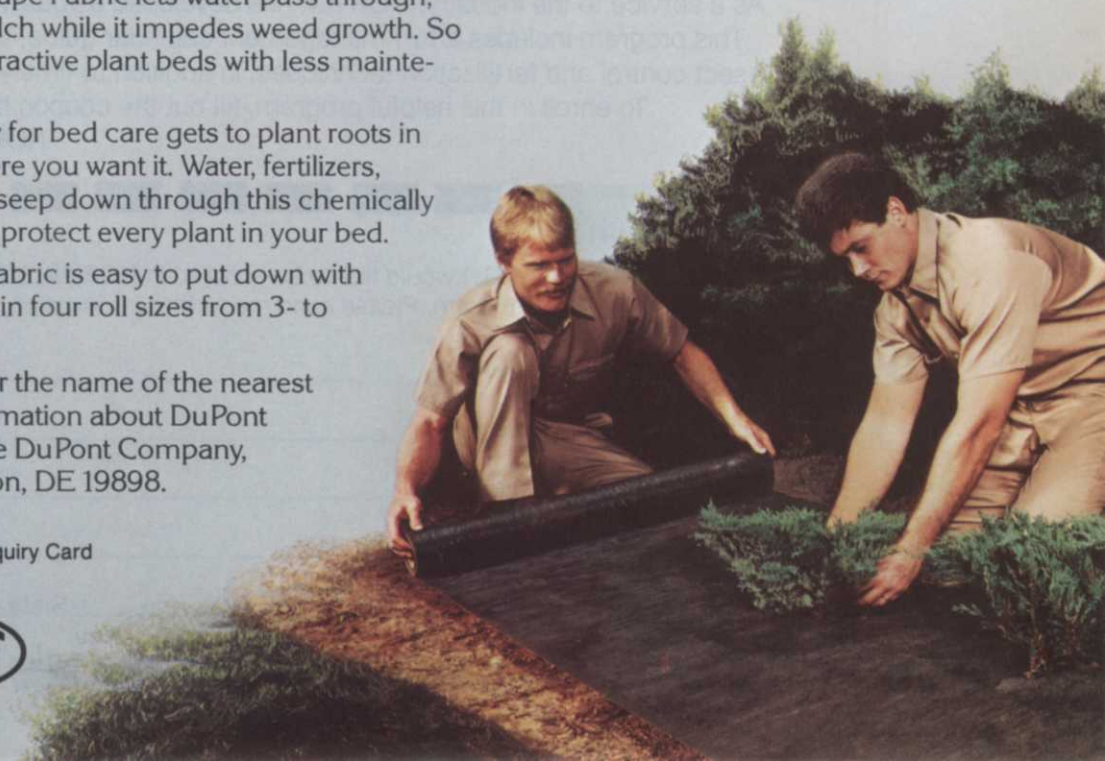
New Du Pont Landscape Fabric. It lets water through to give you healthier beds with less work.

New DuPont Landscape Fabric lets water pass through, reduces wash-away of mulch while it impedes weed growth. So you get healthier, more attractive plant beds with less maintenance work and cost.

Everything you apply for bed care gets to plant roots in the amount you want, where you want it. Water, fertilizers, herbicides and pesticides seep down through this chemically inert fabric to nourish and protect every plant in your bed.

DuPont Landscape fabric is easy to put down with scissors or knife. It comes in four roll sizes from 3- to 12-feet wide.

Call 800-441-7515 for the name of the nearest distributor and more information about DuPont Landscape Fabric. Or write DuPont Company, Room G40955, Wilmington, DE 19898.



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NOR-AM's® TURF PRODUCTS DON'T SIMPLY NOURISH YOUR TURF... THEY PROTECT IT

Now achieve fine turf with fewer problems...thanks to NOR-AM's Total Turf Management Program. This unique program brings you a broad selection of high-performance products that assure healthier turf with better root development, fewer insect problems and less disease destruction.

As a service to the industry, NOR-AM has developed a Total Turf Management Program. This program includes a turf management calendar guide, brochures on turf diseases, insect control and fertilization techniques, in addition to timely turf management reports. To enroll in this helpful program, fill out the coupon below or contact your local NOR-AM sales representative.

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NOR-AM Chemical Company
3509 Silverside Road
P.O. Box 7495
Wilmington, DE 19803
Attn: Communications Dept.

WWT

YES, I would like to be enrolled in NOR-AM's Total Turf Management Program. Please send me further information.

Company _____

Name _____

Title _____

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Nitroform®
Slow predictable release by soil bacteria provides constant 38% nitrogen when most needed for even, sustained growth. Nitroform reduces the risk of nitrate contamination, decreases thatch build-up, is nonburning and nonstreaking, resists leaching even in sandy soil, and assures better root development.

Turcam®
An advanced broad-spectrum carbamate insecticide that controls white grubs, chinch bugs, sod webworms, mole crickets and many other turf and ornamental pests. Turcam is odorless, works well in spray equipment, won't tie up in thatch, won't damage turf or ornamentals, and should be your product of choice when long residual control is required.

Proxol®
Economical Proxol 80SP Insecticide works fast on surface-feeding sod webworms, armyworms and cutworms, and readily penetrates thatch to control grubs. Proxol is easy to apply as a spray, has no unpleasant odor, and no long-term residual build-up in the soil.

Prograss®
A selective herbicide that effectively controls annual bluegrass, crabgrass and other troublesome weed species.

Acti-dione®
Broad-spectrum family of turf fungicides that provide four-season disease control. Acti-dione has proven to be effective without creating resistance problems.

Acti-dione TGF® can be tank-mixed with Bayleton® or Daconil® to complement or improve disease control with significant cost-per-acre savings.

Banol®
Specialized fungicide that controls pythium and phytophthora in turf and ornamental plants. Preventative control with Banol stops the spread of pythium by mowers, foot traffic and surface water; it also means fewer applications, lower rates and savings in labor, fuel and equipment.

NOR-AM
NOR-AM CHEMICAL COMPANY
3509 Silverside Road, P.O. Box 7495
Wilmington, DE 19803

Total Turf Care from the Turf Managers

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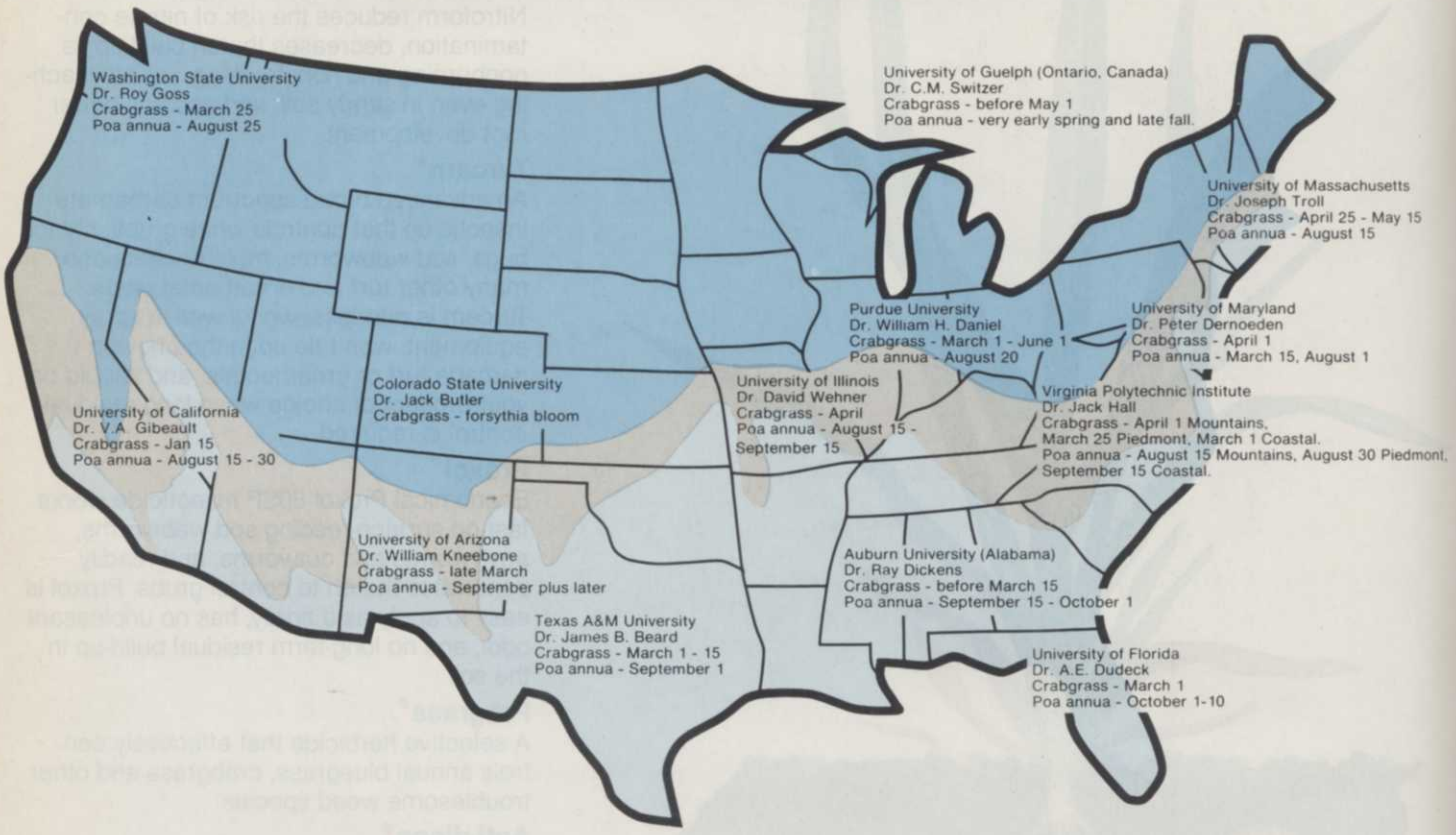
IMPORTANT: Please remember always to read and follow carefully all label directions when applying any chemical.

Suggested timing for preemergence herbicides to control crabgrass and annual bluegrass


Washington State University
Dr. Roy Goss
Crabgrass - March 25
Poa annua - August 25
University of Guelph (Ontario, Canada)
Dr. C.M. Switzer
Crabgrass - before May 1
Poa annua - very early spring and late fall.
University of Massachusetts
Dr. Joseph Troll
Crabgrass - April 25 - May 15
Poa annua - August 15
Purdue University
Dr. William H. Daniel
Crabgrass - March 1 - June 1
Poa annua - August 20
University of Maryland
Dr. Peter Dernoeden
Crabgrass - April 1
Poa annua - March 15, August 1
Colorado State University
Dr. Jack Butler
Crabgrass - forsythia bloom
University of Illinois
Dr. David Wehner
Crabgrass - April
Poa annua - August 15 - September 15
University of California
Dr. V.A. Gibeault
Crabgrass - Jan 15
Poa annua - August 15 - 30
Virginia Polytechnic Institute
Dr. Jack Hall
Crabgrass - April 1 Mountains, March 25 Piedmont, March 1 Coastal.
Poa annua - August 15 Mountains, August 30 Piedmont, September 15 Coastal.
University of Arizona
Dr. William Kneebone
Crabgrass - late March
Poa annua - September plus later
Auburn University (Alabama)
Dr. Ray Dickens
Crabgrass - before March 15
Poa annua - September 15 - October 1
Texas A&M University
Dr. James B. Beard
Crabgrass - March 1 - 15
Poa annua - September 1
University of Florida
Dr. A.E. Dudeck
Crabgrass - March 1
Poa annua - October 1-10

Bermudagrass is the dominant turf species in warmer climates. In general, herbicides that can be used on bermudagrass can be used safely on zoysiagrass.

However, special attention should be paid to herbicide labels regarding applications to centipedegrass and St. Augustine, which are similar to each other in their tolerance to herbicides.

Summer grass weeds: Large crabgrass and dallisgrass invade more turf acreage in the southern U.S. than any other grasses. Germinating seeds of both can be satisfactorily controlled with benefin, bensulide, DCPA, oryzalin, pendimethalin, atrazine, and simazine.

Certain formulations of atrazine are labelled for use on St. Augustine, zoysia, and centipede for sod production while other commercial products containing atrazine are labeled for homeowner use. A combination of acetamide (Dual) and either atrazine or simazine is currently being tested for effectiveness.

Only asulam is used for post-emergence control of crabgrass and dallisgrass in St. Augustine. MSMA and DSMA are effective post-emergence herbicides for these weeds in bermudagrass. The arsonates MSMA and DSMA are used almost exclusively in bermuda and zoysia turfs.

Goosegrass is the most difficult summer grass to control in the South.

Timing of application of pre-emergence herbicides is of paramount importance if control is to be achieved.

We generally think goosegrass starts germinating in significant quantities four to six weeks after crabgrass. However, this may vary. In the lower South, the two species may well germinate simultaneously.

If application of a pre-emergent herbicide is delayed, large crabgrass may escape because it germinates earlier than goosegrass. In bermudagrass and zoysia, large crabgrass can be controlled quite effectively with post-emergence applications of the arsonates.

Pre-emergence herbicides would appear to be a better approach to goosegrass control than post-emergence control with arsonates.

Oxadiazon (Ronstar) and oryzalin (Surflan) give excellent, season-long control of goosegrass. Research has shown post-emergence applications of MSMA plus metribuzin (Sencor) gives good control of goosegrass.

Sandbur and bahiagrass in bermuda and zoysia can be controlled with arsonates.

Research results over the past few years have shown that bahiagrass can be selectively controlled in established centipedegrass with sulfometuron or metsulfuron, but neither material is currently labelled for this use.

At present, there is no selective control of torpedograss in southern turf.

Both annual and perennial sedges are problems in the South. Purple nutsedge and, to a lesser degree, yellow nutsedge are the most severe problems.

Multiple applications of arsonates or an arsonate/phenoxy combination are generally recommended for purple nutsedge, only on bermuda or zoysia. Basagran can be used for control of yellow nutsedge and several annual species.

Summer broadleaf weeds are a problem throughout Southern turf but not to the extent of the grassy weeds, such as dallisgrass, large crabgrass, and goosegrass.

Prostrate spurge and Virginia buttonweed, along with yellow woodsor-

GRASSY WEEDS

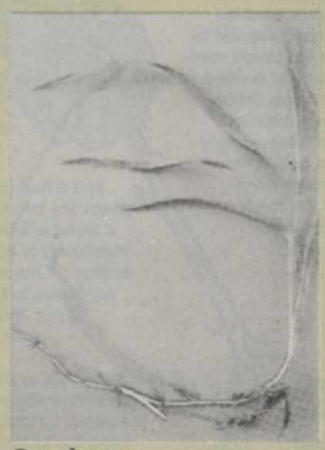
Wild garlic

Common yellow woodsorrel

Goosegrass

Crabgrass

Yellow nutsedge


Quackgrass

Dallisgrass

Annual bluegrass

rel, are important and difficult-to-control broadleaf weeds.

Multiple applications of 2,4-D plus dicamba, Trimec, or Trex-San are almost always necessary. Researchers suggest the use of a non-ionic surfactant with the herbicide.

Winter grass weeds: Annual bluegrass is by far the most severe grassy weed infesting southern turf during the late fall, through the dormancy period, and into the early spring.

Annual bluegrass decreases the aesthetic value of turf and interferes with warm-season turfs in late spring.

Coverage is usually slow following fade out of annual bluegrass, leaving large sections of bare ground exposed. Other weeds, such as goosegrass, tend to move into bare areas.

Annual bluegrass control with pre-emergence herbicides is usually accomplished with either benefin, bensulide, DCPA, oryzalin, pendimethalin, pronamide, simazine, or oxadiazon.

Two applications may be necessary during the dormant season for acceptable control, except with pronamide, oryzalin, or simazine, all of which provide pre-emergence and post-emergence control of annual bluegrass in bermudagrass.

There are three choices for annual bluegrass control on bermudagrass greens overseeded with perennial ryegrass.

Bensulide may be applied prior to overseeding as a pre-emergence approach. Ethofumesate may be applied 15 to 30 days after overseeding. Check label for timing to avoid delaying spring transition back to bermudagrass.

Fenarimol, a fungicide, applied two weeks prior to overseeding, controls several turf diseases in addition to controlling annual bluegrass.

Another approach employed particularly on golf courses, is to use a post-emergence, non-selective herbicide such as paraquat, glyphosate, or cacocylic acid prior to the warm-season turf breaking dormancy. This

How New Generation Trimec® HERBICIDE Can Help Solve the Problems Facing Turf Managers Today.

. . . Achieving immaculate, weed-free turf ★ the elimination of retreatments ★ earlier-season control ★ lower cost per acre ★ less chemical in the environment. Let me explain how Super Trimec® Broadleaf Herbicide can help you with these problems and become progressively more economical in the second and third years.

Everett Mealman, *president*
PBI/Gordon Corporation

Super Trimec is a remarkable breakthrough in herbicide chemistry. We discovered in working with radio isotope tracer studies that formulations *do* make a difference in performance, and Super Trimec is the best product we have produced. The complex is created by combining certain esters with dicamba . . . something no one else has ever been able to do.

It is a synergistic and eutectic ester that behaves like an amine.

Super Trimec has unparalleled penetrating power in getting through the cuticle and into the circulatory systems of even the toughest weeds. For a better understanding, you may enjoy examining the schematic diagram on this page.

Less Chemical Reduces the Cost

One gallon of Super Trimec covers four acres; yet the spectrum is so broad, and the activity so powerful, that it even controls such tough species as ground ivy, oxalis, and spurge.

Further Cost Reductions in 2nd and 3rd Years

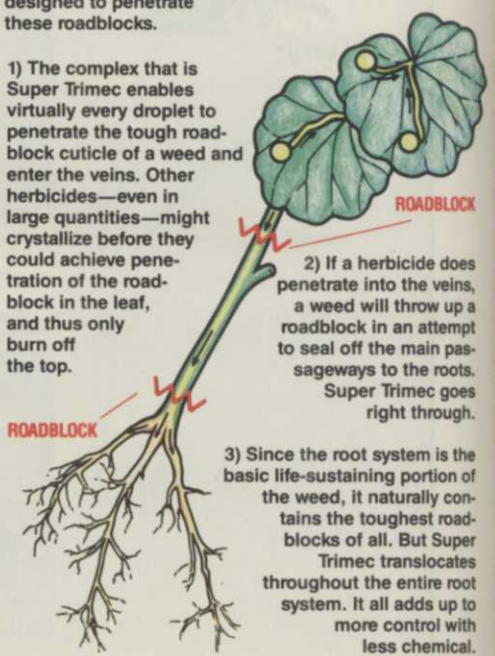
But wait! We are getting reports from turf managers who have been using Super Trimec for two years, and now are saying their turf is so clean that they intend to spray only once this year, in the early spring, and then spot treat as needed. Imagine what a pleasant surprise it is to see your herbicide cost go down each year.

. . . and here's another pleasant surprise. Super Trimec is compatible with Ferromec™ Liquid Iron, our patented sprayable complex that produces turf green-up in 24 hours. Ferromec was sprayed on the turf of the Rose Bowl to create the beautiful green you saw on TV New Year's day.

Schematic drawing shows why Super Trimec outperforms other herbicides

Since the purpose of life is to live and grow, plants throw up roadblocks to prevent herbicides from entering their systems, much like white corpuscles will rush to a wound and build up a roadblock to prevent a pathogen from entering the bloodstream. The unique combination of esters in Super Trimec is designed to penetrate these roadblocks.

1) The complex that is Super Trimec enables virtually every droplet to penetrate the tough roadblock cuticle of a weed and enter the veins. Other herbicides—even in large quantities—might crystallize before they could achieve penetration of the roadblock in the leaf, and thus only burn off the top.



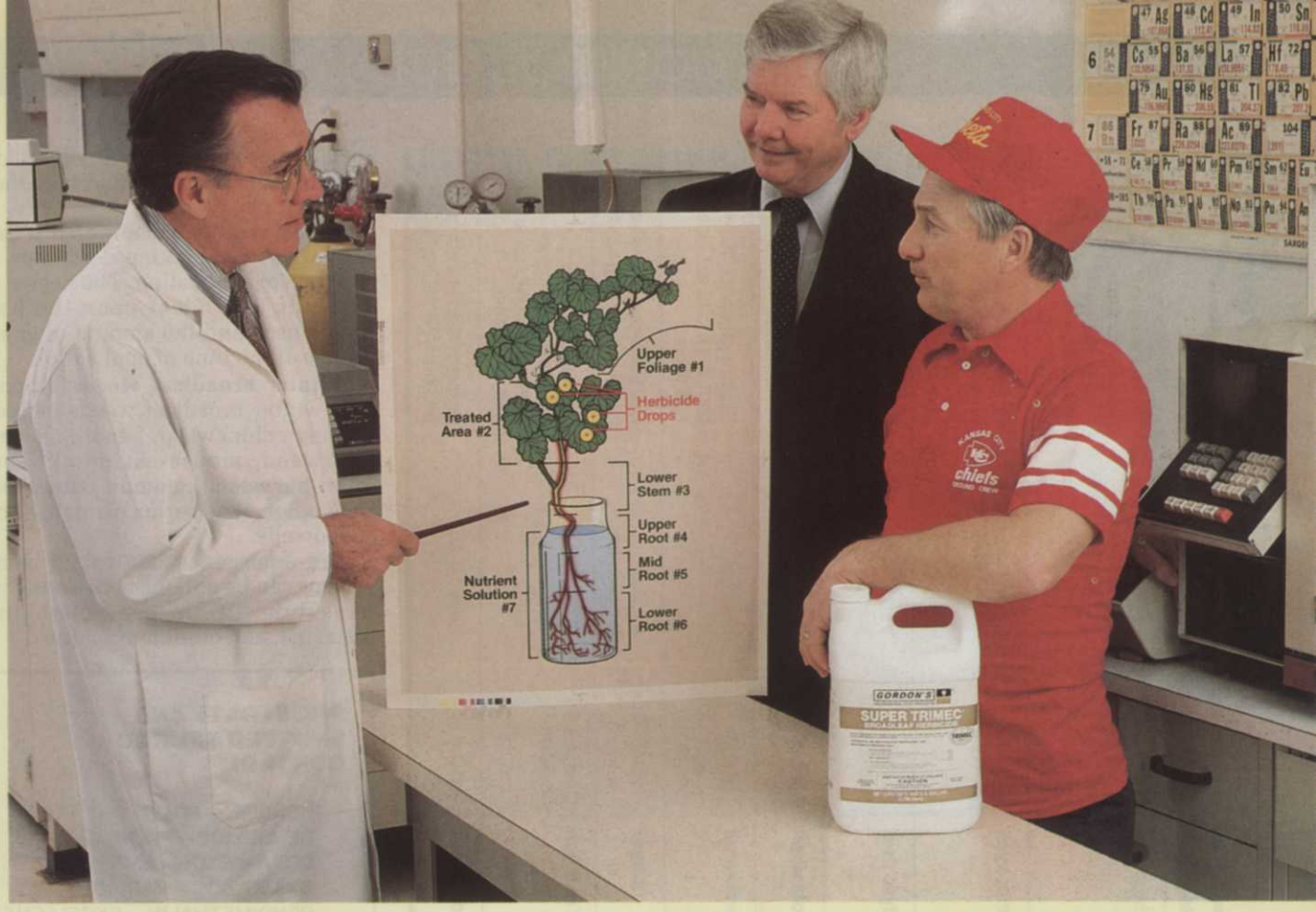
2) If a herbicide does penetrate into the veins, a weed will throw up a roadblock in an attempt to seal off the main passageways to the roots. Super Trimec goes right through.

3) Since the root system is the basic life-sustaining portion of the weed, it naturally contains the toughest roadblocks of all. But Super Trimec translocates throughout the entire root system. It all adds up to more control with less chemical.

Since late 1983 we have sent out some 11,000 samples of Super Trimec, and the response has been so overwhelmingly positive that we now make this flat statement: Dollar for dollar and acre for acre of immaculate, weed-free turf, Super Trimec is the most efficient post-emergent broadleaf herbicide in the world . . . period.

YOUR GUARANTEE OF A TRIMEC® COMPLEX PROFESSIONAL QUALITY®

SUPER



Dr. Jan Van Diepen, director of research for PBI/Gordon, shows a printout of a radio isotope tracer study to Everett Mealman and George Toma, the nationally recognized turf authority who has been in charge of preparing the playing fields for every Super Bowl and Pro Bowl to date.

The purpose of such studies at PBI/Gordon is to determine the smallest possible amount of the strongest possible chemical formulation that can translocate to the root system of a weed and result in total control. Toma has been using Super Trimec at the Truman Sports Complex and the Chiefs' practice fields for two years, and he says, "We constantly test herbicides, and nothing is as efficient as Super Trimec."

Ask for Samples of these New PBI/Gordon Products

Among the new products that have been developed and thoroughly tested by PBI/Gordon, and are now ready to help the lawn care operator improve his efficiency, are Ferromec™ Liquid Iron, a sprayable iron complex that produces turf green-up within 24 hours; and Bov-A-Mura® Natural Organic Activator that helps turn thatch into humus.

You'll be reading about these new products in the trade papers. But in the meantime, if you would like to have samples of them, simply write to us or call.

Toll-free 1-800-821-7925
In Missouri 1-800-892-7281
Ask for Customer Service Department

Inform us of bids to be let.
We will furnish detailed specs and names of distributors serving your area.

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pbi/gordon corporation

1217 WEST 12th STREET
P. O. BOX 4090
KANSAS CITY, MISSOURI 64101

TRIMEC®

660-186

BROADLEAF HERBICIDE

Herbicide Directory

Herbicide	Brand Name(s)	Company	Uses
amitrole	Amitrole-T	Union Carbide	Non-selective grass and broadleaf control in non-crop areas including ditches, roadsides, industrial areas & marshes.
ammonium sulphanate	Ammate	DuPont	Non-selective rights of way herbicide
asulam	Asulox	Rhone Poulenc	Postemergence grassy weed control for turf and ornamentals
atrazine	Aatrex	Ciba Geigy	Non-selective control in non-crop areas.
benefin	Balan	Elanco	Preemergence control of annual grasses and broadleaf weeds in established turf.
bensulide	Betasan Pre-San Lescosan Betamec-4	Stauffer Mallinckrodt Lesco PBI Gordon	Preemergence control of annual grasses and broadleaf weeds in established turf and established flower gardens. Safe near tulip and daffodil bulbs.
bentazon	Basagran	BASF	Selective postemergence control of nutsedge in warm-season turf.
bromacil	Hyvar	DuPont	Nonselective control of weeds and grasses in non-crop areas. usually mixed with diuron for roadsides and rights-of-way.
bromoxynil	Brominal Buctril	Union Carbide Rhone Poulenc	Postemergence control of broadleaf weeds in seedling turf, established turf and non-crop areas.
cacodylic acid	Phytar Rad-E-Cate	Vertac Vineland	Nonselective control for turf renovation, edging and in plant beds.
chloramben	Amiben	Union Carbide	Preemergence control in ornamentals.
chlorflurenol	Maintain	Uniroyal	Growth regulator. Also controls broadleaf weeds and vines.
copper	Cutrine-Plus	Applied Biochemists	Control algae, chara and hydrilla in potable water.
dalapon	Dalapon 85 Dowpon M	SDS Biotech Dow	Selective control of perennial and annual grasses in non-crop areas and ditchbanks.
dazomet	Mylone	Hopkins Ag.	Preplant sterilant for turf and ornamental beds.

usually does an excellent job on annual bluegrass and annual broadleaf weeds.

Injury is often encountered if bermudagrass is breaking dormancy at the time of application. The degree of injury is dependent upon the herbicide used and the amount of green foliage at the time of application.

Winter broadleaf weeds: Important winter broadleaf weeds include common chickweed, henbit, clovers, spurweed, mouse-ear chickweed, lawn burweed, common dandelion, wild onion, wild garlic, plantains, and speedwells.

Pre-emergence control of some species can be obtained with benefin, bensulide, DCPA, pendimethalin, simazine, and other herbicides.

PROSTRATE AND SPOTTED SPURGE CONTROL

BENEFIN—*POOR*
BENSULIDE—*POOR*
DCPA—*EXCELLENT*
OXADIAZON—*VARIABLE*
PENDIMETHALIN—*EXCELLENT*
SIDURON—*VARIABLE*

Henbit, chickweed, and clovers usually require something other than 2,4-D for post-emergence control. In dormant bermudagrass and zoysiagrass, dicamba or combinations with dicamba are used often for post-emergence control.

The phenoxys are safe on completely dormant turfs. However, actively growing turfs vary considerably in tolerance to phenoxy materials.

St. Augustine will usually tolerate 0.5 lbs./acre of 2,4-D with only minimal injury. At rates above that, St. Augustine is usually injured.

This may be unimportant when using phenoxys on dormant warm-season turfs, but invariably application is made during spring transition. All turfgrasses are more susceptible to phenoxy injury during this transition period.

The combination of mecoprop plus chlorfurecol is often used, especially by the homeowner on St. Augustine.

Several experimental herbicides show promise for control of wild garlic and numerous winter broadleaf weeds. Single applications of imazaquin, sulfometuron, and metsulfuron have provided control of wild garlic equal to that obtained from multiple applications of phenoxy herbicides. **WT&T**

Insecticide-Nematicide

NEW CHIPCO® MOCAP® RUBS OUT GRUBS FASTER.

New CHIPCO® MOCAP® insecticide gives you the kind of grub control you need...control that's fast and effective.

CHIPCO MOCAP starts killing grubs as soon as you water it in. Other products take hours or days to work.

And all that time, grubs continue to feed, destroying your turf.

For best results, apply CHIPCO MOCAP before grubs start to feed—usually in August or early September. But if grubs get the jump on you, you can still take control quickly and effectively with fast-acting CHIPCO MOCAP.

And fast action is just part of the story. CHIPCO MOCAP gives effective control of a broad spectrum of grubs.

CHIPCO MOCAP KILLS OTHER TURF INSECTS, TOO.

CHIPCO MOCAP knocks out a broad range of surface insects, including chinchbug and sod webworm. And if nematodes or mole crickets are destroying your turf, you can destroy them, too, with CHIPCO MOCAP.

For the fastest, most effective control of grubs and other turf pests, include CHIPCO MOCAP in your turfgrass management program. CHIPCO MOCAP from Rhône-Poulenc Inc., makers of CHIPCO® 26019 and CHIPCO® Ronstar,® is a new addition to the CHIPCO line of fine products for turfgrass protection.

For more information write to Rhône-Poulenc, CHIPCO Department, P.O. Box 125, Monmouth Junction, NJ 08852

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CHIPCO® MOCAP®

Rubs out grubs.

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Herbicide Directory

Herbicide	Brand Name(s)	Company	Uses
DCPA	Dacthal	SDS Biotech	Preemergence control of annual grasses and broadleaf weeds in turf and ornamental beds.
dicamba	Banvel	Velsicol	Selective postemergence control of broadleaf weeds in turf and for noncrop control of brush.
dichlobenil	Dyclomec	PBI Gordon	Selective weed control in ornamental beds and for total weed control on roadsides, fencerows, etc.
dichlorprop	2,4-DP	SDS Biotech	Brush control and aquatic weed control.
diphenamid	Enide	Nor-Am, Upjohn	Selective control of annual grasses and broadleaf weeds in bermudagrass, dichondra and around ornamentals.
DSMA	Methar 30 Ansar DSMA Liquid DSMA 81% Weed-E-Rad	W.A. Cleary SDS Biotech Drexel Vertac Vineland	Selective postemergence control of sedges and grasses in turf and ditchbanks and storage yard.
diuron	Karmex Dynex Diuron 80WP Urox	DuPont Vertac Drexel Hopkins	Generally used at high rates for nonselective total weed control in industrial sites.
diquat	Diquat	Ortho, Chevron	Aquatic weed control.
endothall	Aquathol K Endothall	Pennwalt Pennwalt	Aquatic weed control and turf herbicide and dessicant.
EPTC	Eptam	Stauffer	Selective control of annual grassy weeds, nutgrass, and perennial weeds.
ethofumesate	Prograss	Nor-Am	For control of Poa annua and white clover in fairways.
fenac	Fenac	Union Carbide	Preemergence long-term control of weeds, usually mixed with other herbicides.
fosamine	Krenite	DuPont	Brush control.
flurprimidol	Cutless	Elanco	Growth regulator that suppresses annual bluegrass.
fluazifop-butyl	Fusilade	ICI Americas	Selective postemergence control of grassy weeds in ornamentals.
fluridone	Sonar	Elanco	Broad spectrum herbicide for submersed and emersed aquatic weeds.
glyphosate	Rodeo	Monsanto	For control of emerged aquatic weeds and broad leaf weeds in or near aquatic sites, such as ditchbanks.
glyphosate	Roundup	Monsanto	Nonselective, short-term hervicide for turf renovation and total weed control along fences and plant beds.
imazaquin		American Cyanamid	Experimental herbicide for turf
imazapyr	Arsenal	American Cyanamid	Broad spectrum systemic industrial herbicide
linuron	Lorox	DuPont	Short-term control of annual weeds in roadsides and fence rows.
mefluidide			Growth regulator that suppresses Poa annua.
methyl bromide	Dowfume	Dow	Fumigant for pre-plant control. Also kills weed seed.
metham	Vepam	Stauffer	Preplant soil fumigant killing weeds, weed seed, insects and fungi.
metribuzin	Sencor	Mobay	Postemergence control of goosegrass in warm-season turf.

continued

New Team prevents your weeds with all-season stamina. It's gentle on cool season turf grass, including bluegrass, ryegrass and other fairway grass species. And new Team pre-emergence herbicide consistently delivers better control, longer control for your crabgrass. It also provides head-to-head goosegrass control.

New Team spreads very easily. The clay carrier makes equipment calibration simpler and application more accurate. It also reduces dust problems.

Call time-out on crabgrass and goosegrass on your turf, for all season. With new Team.

Talk to your Elanco distributor soon.

Or write:

Elanco Products Company
A Division of Eli Lilly and Company
Dept. E-455, Indianapolis, IN 46285, U.S.A.

Team™—(benefin + trifluralin, Elanco Products Company)
Refer to the Team label for proper application instructions.

Circle No. 122 on Reader Inquiry Card

Put down new Team™ this spring.

Or put up with crabgrass and goosegrass this summer.

The Wisconsin State Capitol and its lovely grounds are a popular attraction in Madison.

Grounds for Ransomes.

The immaculate appearance of the Capitol grounds in Madison leaves a lasting impression on the many visitors who come to Wisconsin each year. When pride is a factor, the air-cooled T-24N from Ransomes is a sensible choice for keeping government grounds, parks, campuses and industrial complexes looking their very best. And it won't create a budget deficit, either. This strong, durable tractor has what it takes to provide sure, dependable service. And that's grounds for seeing your Ransomes Bob Cat distributor. Or, call Ransomes, Inc., One Bob Cat Lane, Johnson Creek, WI 53038. (414) 699-2000.

RANSOMES

The grass machine.

Circle No. 160 on Reader Inquiry Card

 from page 80

Herbicide	Brand Name(s)	Company	Uses
MCPP	MCPP Mecomec MCPP Chipco Turf Herbicide	SDS Biotech PBI Gordon WA Cleary Rhone Poulenc	Selective broadleaf weed control in turf. Often combined with other herbicides.
MSMA	Ansar Broadside Ansar Weed-Hoe	SDS Biotech Vertac Drexel Vineland	Postemergence selective control of crabgrass and broadleaf weeds in turf. Also, grassy weed control in ditchbanks, roadsides, industrial areas.
napropamide	Devrinol	Stauffer	Selective control of weeds in ornamental beds and containers. Experimental combination with Betasan for season-long crabgrass control in turf.
oryzalin	Surflan	Elanco	Preemergence control of weeds in established ornamentals and warm-season turf.
oxadiazon	Ronstar	Rhone Poulenc	Preemergence control of weeds in ornamentals and turf.
oxyfluorfen	Goal	Rohm & Haas	Selective control of weeds in ornamentals.
paraquat	Paraquat	Ortho, Chevron	Nonselective control of weeds in rights-of-way, industrial areas and fencerows.
pendimethalin	Proturf Weedgrass Control	Scotts	Preemergence turf herbicide for control of grassy and broadleaf weeds.
picloram	Tordon	Dow	Systemic, long-term killer of woody plants and broadleaf weeds.
prometon	Pramitol	Ciba Geigy	Nonselective herbicide with long residual for industrial weed control.
pronamide	Kerb	Rohm & Haas	Poa annua control in warm season grasses. Also weed and grass control around woody ornamentals and Christmas trees.
sethoxydim	Poast	BASF	Postemergence control of grassy weeds around broadleaf ornamentals.
siduron	Tupersan	DuPont	Preemergence control of annual grasses in newly seeded turf areas.
simazine	Princep	Ciba Geigy	Selective control of annual grasses and broadleaf weeds in established bermudagrass. Also, used in industrial and aquatic weed control.
sulfometuron	Oust	DuPont	Non-selective industrial and selective in bermudagrass.
tebuthiuron	Spike	Elanco	Brush control and total vegetation control in non-crop areas.
trifluralin	Treflan	Elanco	Selective preemergence weed control in established ornamentals and under asphalt.
trichlopyr	Garlon	Dow	Systemic control of woody plants in rights-of-way and industrial sites.
2, 4-D	2, 4-D	Dow SDS Biotech Rhone Poulenc Vertac	Selective control of weeds in turf and numerous other areas. Usually mixed with other herbicides.
Vorlex	Vorlex	Nor-Am	Preplant fumigant. Broadleaf weed control in established turf.

2, 4-D plus MCPP	Chipco Turf Kleen Cleary Scotts II SDS Tee Time Lescopar	Rhone Poulenc WA Cleary OM Scott SDS Biotech Andersons Lesco	Broadleaf weed control in established turf.
2, 4-D plus dicamba	Scotts I Banvel Plus Lesco Selective Herbicide	OM Scott Velsicol Lesco	Selective postemergence control of weeds in turf.
2, 4-D plus MCPP plus dicamba	Trimec Trexan	PBI Gordon Mallinckrodt	Selective, broad spectrum control of weeds in turf.
2, 4-D plus MCPP plus dicamba plus MSMA	Quadmec	PBI Gordon	Broad spectrum postemergence control of broadleaf weeds and annual grasses.
2, 4-D plus dichlorprop	Weedone DPC	Union Carbide	Selective postemergence control of weeds in turf.
2, 4-D plus dichlorprop	Weedone DPC Amine	Union Carbide	Broad-spectrum, selective, postemergence control of weeds in turf.
2, 4-D plus 2,4-D plus dicamba	Trimec Ester	Bulkkem	Selective, broad spectrum control of weeds in turf.
2, 4-D plus dicamba plus dalapon	Banvel Plus	Velsicol	Broad spectrum, post-emergence turf weed control.
2, 4-D plus prometon	Vegemec	PBI Gordon	Selective postemergence control of weeds in turf.
2, 4-D plus triclopyr	Turflon-D	Dow Chemical	Selective postemer-gence turf herbicide for broadleaf weeds.
Balan plus Ronstar	Regalstar	Regal Chem.	Broad spectrum pre-emergence control of weeds in turf.
amitrol plus simazine	Amizine	Union Carbide	Season-long control of weeds and grasses

Herbicide Combinations

MSMA plus cacodylic acid	Broadside	Crystal	Nonselective, broad spectrum weed control.
diuron plus sodium chlorate plus sodium metaborate	Chlorea	Rhone Poulenc	Nonselective weed and grass killer.
Amitrole plus fenac plus atrazine	Fenamine	Union Carbide	Pre- and postemer-gence control of weeds for industrial sites and rights-of-way
benefin plus oryzalin **benefin plus trifluralin**	XL Team	Elanco	Preemergence control of annual grasses and broadleaf weeds in established turf.
bensulide plus oxadiazon	ProTurf Goosegrass/ Crabgrass Control	OM Scott	Broad-spectrum pre-emergence control of annual grasses
bromacil plus diuron	Rout Krovar	Hopkins DuPont	Wide range control of weeds in industrial sites and rights-of-way
MSMA plus dicamba	Mondak	Velsicol	Noncropland general weed control.
prometon, simazine and chlorate	Pramitol	Ciba Geigy	Full-season weed control in industrial sites.
tebuthiuron plus trifluralin	Spike Treflan	Elanco	Non-selective, season-long, preemergence and postemergence control of weeds industrial and non-cropland areas.

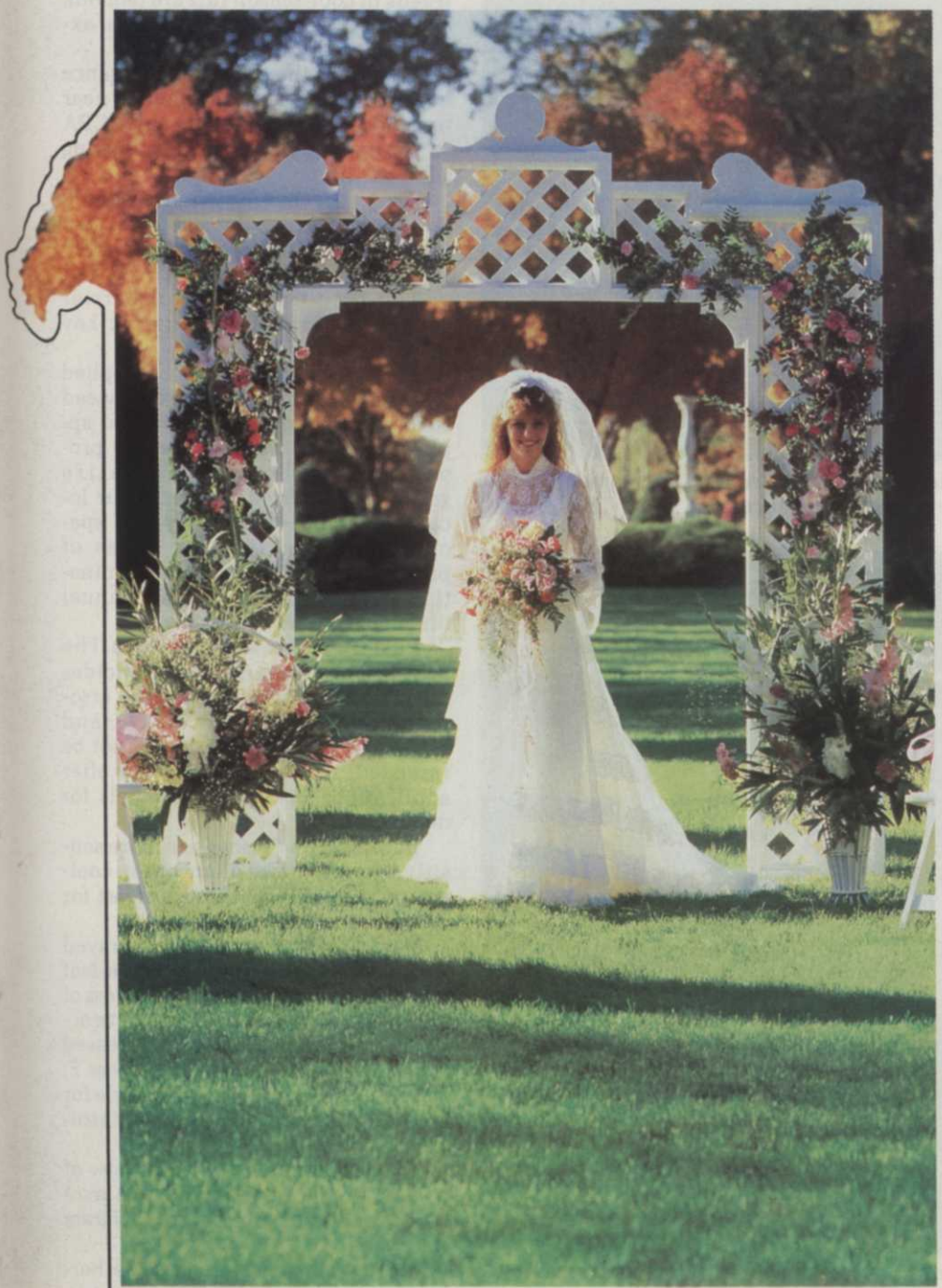
BROADLEAF WEEDS POST-EMERGENT HERBICIDE COMBINATIONS:

- TRIMEC
- TREXSAN
- SUPER TRIMEC
- TURFLON
- WEEDONE DPC

PREEMERGENCE HERBICIDE SOIL LONGEVITY:

- BENEFIN
- DCPA
- OXADIAZON
- PENDIMETHALIN
- BENSULIDE

A thing of beauty is a joy forever. Unless there are grubs in there.



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OFTANOL works in the top 1-1½ inches of soil, where the grubs are, and remains active.

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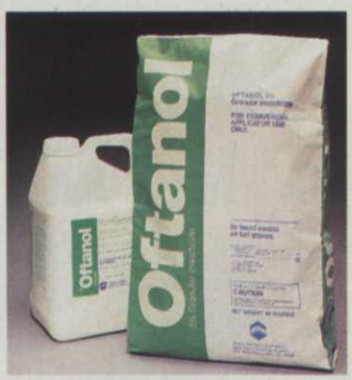

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IT STOPS THE SPOILERS.

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Circle No. 184 on Reader Inquiry Card

COOL-SEASON TURF

by Robert Shearman, University of Nebraska

Herbicide soil persistence can affect overseeding and reestablishment efforts. Read the pesticide label for more information concerning potential effects on seed.

Annual broadleaf weeds, like the knotweed (above), are best controlled in their early stages of growth and development.

A complete weed control program includes both pre-emergence and post-emergence herbicides, as well as cultural practices.

The primary pre-emergence herbicides for grassy and broadleaf weeds in cool-season turf are benefin, bensulide, DCPA, pendimethalin, oxadiazon, and siduron.

Siduron is the only pre-emergence herbicide that can be applied near time of seeding. Bensulide and DCPA can be applied in the spring following a fall seeding.

Pre-emergence herbicides should be watered in so the chemical can form a barrier in the soil prior to weed seed germination.

The resulting chemical barrier should not be disturbed during key weed germination periods.

The herbicides should be applied two weeks prior to the expected weed seed germination period. Second applications may be necessary to provide control over the entire germination period. Contact your local university or industry turf specialist for germination times of primary weeds. Also, see the germination map for crabgrass and annual bluegrass in this guide.

Post-emergence herbicides. The primary post-emergence herbicides for grassy weeds in turf are the arsonates; MSMA, DSMA, CMA, and MAMA. Treated areas should not be reseeded for a month or more after application. See pesticide labels for details.

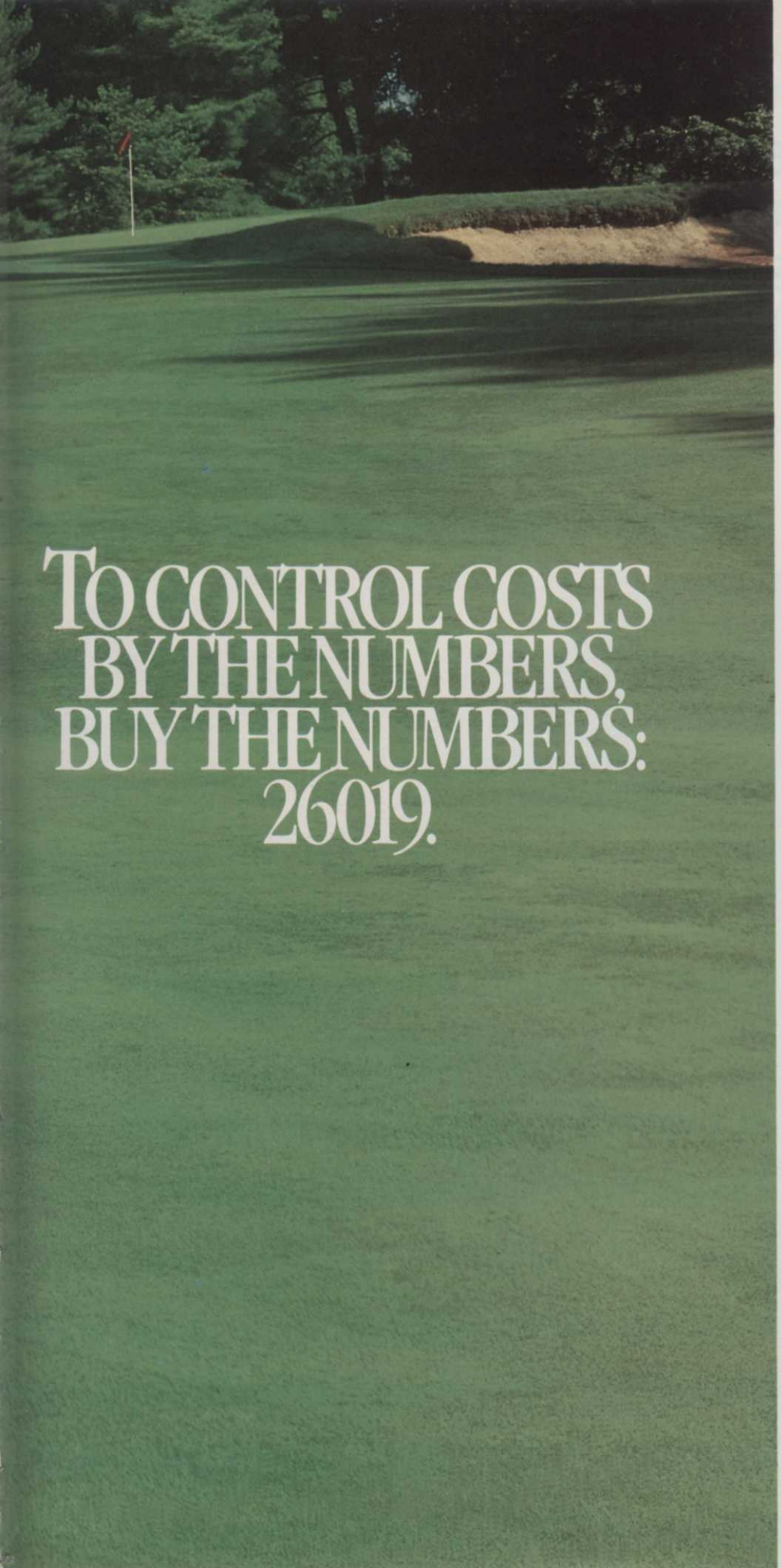
Bentgrass and fescue are more sensitive to arsonates than other cool-season grasses. CMA is the safest for bentgrass.

Weed foliage should be sprayed while still young (two- or three-leaf stage), if possible. The effectiveness of arsonates improves with temperature, so rates need to be increased for temperatures below 80 degrees F.

A new post-emergent herbicide for annual grass control has been introduced this season.

Acclaim offers a wider window of post-emergence control than the arsonates with less potential for turfgrass injury.

The primary post-emergence herbicides for broadleaf weeds are 2,4-D,



TO CONTROL COSTS BY THE NUMBERS, BUY THE NUMBERS: 26019.

CHIPCO® 26019 fungicide costs less because it works longer.

You'd expect a premium product to cost more. But in the case of CHIPCO 26019 fungicide, its quality translates into greater cost-effectiveness than you'll find with any other product.

At the labeled spray interval of 28 days, you can protect your fairways for under 10¢ per 1000 square feet per day.

The cost alone might convince you to give it a try. But performance against turf disease makes CHIPCO 26019 the leading fungicide on the market.

A fairway disease prevention program based on CHIPCO 26019 will give effective, long-lasting protection against the major diseases: Helminthosporium Leaf Spot and Melting Out, Dollar Spot, Brown Patch, Fusarium Blight, Red Thread, Fusarium Patch, and Gray and Pink Snow Molds.

So if you want to economize without compromise, buy the numbers: CHIPCO 26019 fungicide.

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CHIPCO 26019

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The dawn of a new season. Now two out of three courses spray Daconil 2787.®

Unreliable control from narrow-spectrum fungicides. Inconsistent performance from longer residual systemics. That's why two out of every three golf courses are now being treated with regularly scheduled applications of Daconil 2787 fungicide.

And for good reason.

Only Daconil 2787 has a proven record of consistent, first-rate control of eleven major turf diseases. Including tough ones such as Helminthosporium melting out, benomyl-resistant dollar spot and large brown patch.

What's more, there has never been a documented case of resistance in over fifteen

years of use. Even on courses where Daconil 2787 was applied at weekly intervals for many seasons. Convincing proof that you don't have to alternate sprays to avoid developing resistance to Daconil 2787.

And when it comes to cost, nothing is more economical than Daconil 2787. On a per 1000 sq. ft. basis, a single application of Daconil 2787 Flowable Fungicide costs less than Tersan® 1991, Chipco® 26019, Bayleton,® Rubigan® or even Dyrene.®

Plus you never have to add a costly spreader/sticker to Daconil 2787. Because it's already built into the formulation. So you're assured of full and even plant coverage for maximum disease prevention.

This season, be one of the thousands of superintendents who made the right choice. Make your fungicide Daconil 2787 from tee to green.

The following names are registered trademarks:

Tersan—E.I. du Pont de Nemours & Company

Chipco—Rhône-Poulenc

Bayleton—Parent Company of Farbenfabriken Bayer GmbH, Leverkusen

Rubigan—Elanco Products Company

Dyrene—Mobay Chemical Corporation

Circle No. 169 on Reader Inquiry Card

Now packaged in 2½ gallon containers.

Agricultural Chemicals Business
SDS Biotech Corporation
7528 Auburn Road, P.O. Box 348
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2,4-DP, dicamba, and MCPP. Formulations of these products, such as Trimec and Weedone DPC, provide increased effectiveness on hard-to-control species. Turflon-D (triclopyr plus 2,4-D) is effective on some of the more difficult-to-control broadleaf weeds, such as knotweed and yellow woodsorrel.

These herbicides should not be applied until a new lawn has been mowed at least three times. The target weeds should be actively growing for best results.

The temperature at applications should be at least 60 degrees F. Applications during extreme heat or drought can cause severe damage to desirable turf.

Two treatments of post-emergence herbicides are generally necessary to control broadleaf weeds. See labels for the proper interval between applications.

Winter annuals can be sprayed early in the year, followed by summer annuals and perennials. Fall treatment for perennials is possible.

Post-emergence herbicides are often combined to achieve improved control and reduce the need for repeat applications.

Occasionally, a landscape manager or sod producer chooses to fumigate a seedbed prior to planting to reduce weed seed, control insects and disease, and eliminate off-type grasses.

Methyl bromide (Dowfume), metham (Vapam), dazomet (Mylone), and Vorlex are used for pre-plant fumigation. See labels for delay period following treatment and before seeding.

Renovation of turf stands is gaining acceptance, especially since the development of glyphosate (Roundup).

During renovation all existing vegetation is killed, and the area is reseeded in a matter of weeks without major cultivation. Glyphosate is deactivated within a few days after application. Amitrole, cacodylic acid, and dalapon can also be used, but the delay period for seeding may be from four to eight weeks.

Progress is being made in selectively killing annual bluegrass in perennial ryegrass, Kentucky bluegrass, and bentgrass fairways.

Late-summer and early-fall applications of ethofumesate (Progress) are particularly promising.

Late-season applications of mefluidide and flurprimidol have also reduced annual bluegrass competition in cool-season turfs. **WT&T**

HERBICIDE MANUFACTURERS

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1 Cyanamid Plaza
Wayne, NJ 07470
(201) 831-2000.

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Applied Biochemists
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BASF Wyandotte
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Somerset, NJ 08873
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Crystal Chemical Co.
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Houston, TX 77055
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Dow Chemical USA
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Drexel Chemical Co.
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Elanco Products Co.
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Indianapolis, IN 46285
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(816) 421-4070.

Hopkins Agric. Chem. Co.
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Madison, WI 53707
(608) 222-0624.

ICI Americas, PO Box 751
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Lebanon Chemical Corp.
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Ortho Div., Chevron
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Pennwalt Corp.
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Stauffer Chemical Co.
Agricultural Chem. Div.
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Agricultural Products
T.W. Alexander Drive
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NC, 27709.
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Uniroyal Chemical
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(203) 723-3000.

Velsicol Chemical Corp.
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Chicago, IL 60611
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Vertac Chemical Corp.
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Suite 2414
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***Fiesta** – for permanent turf or overseeding – rapidly becoming the first choice of turf professionals.*

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TURF-TYPE TALL FESCUE

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RIGHT-OF-WAY WEED CONTROL

by R. W. Bovey, USDA-ARS, College Station, Tex.

Many areas around buildings, ditchs, billboards, poles, factories, shops, golf courses, parking areas, parks, industrial plant sites, vacant lots, schools, airports, roadsides, fences, lawns, pipelines, and other public or non-cropland areas may harbor unwanted trees and brush.

If these undesirable woody plants re-sprout after top removal, they may be difficult to kill and remove and cause unsightly appearance or interfere with the intended use of the property. The landscape manager has many options at his disposal to control and remove undesirable woody vegetation and replace it with desirable cover.

Woody plants can be removed by two primary methods or combinations of these methods which include mechanical or chemical means. The selection of the method depends upon:

- size of the area to be cleared;
- size of the brush;
- difficulty of control and kind of brush;
- proximity to valuable vegetation, water sources, and population centers; and
- use to be made of the area following brush removal.

Workmen clear brush from right-of- way area.

Control methods

It is essential that problem plants be accurately identified so the proper control methods can be used. If the species cannot be identified, consult the local county agent, extension specialists, or personnel from the State Agricultural Experiment Station or U.S. Department of Agriculture. Some well-illustrated circulars, bulletins, and books are also available.

Mechanical Control. Hand methods of brush control, although effective, are slow, costly, and laborious. They are practical on small areas or in scattered stands.

Hand methods include grubbing, cutting, girdling, and burning.

Grubbing consists of using a grubbing hoe, shovel, or similar tool to dig enough of the root system out of the soil to kill the plants. The operation is difficult and time consuming, but effective if properly done.

Cutting down brush with axes or saws is most effective on woody species that are killed when the top growth is removed, such as eastern red cedar and blueberry juniper. Species that re-sprout can be treated with herbicides to prevent re-sprouting.

Girdling is cutting a ring through the bark and cambium layer to prevent movement of water and nutrients to top growth. Girdling is practical in scattered stands of large trees six inches in diameter or greater. It is most effective during the summer months. Herbicides can be applied to the cut ring for improved kill.

Portable chain or power saws and girdlers are available for brush control. They reduce labor, time, and cost in brush removal but have limited use in dense stands or large areas.

Dozing is one of the more widely-used methods of brush control. Much clearing is done with straight dozer blades; however, many modifications and attachments are available for specialized clearing jobs.

Ideally, dozing removes brush and

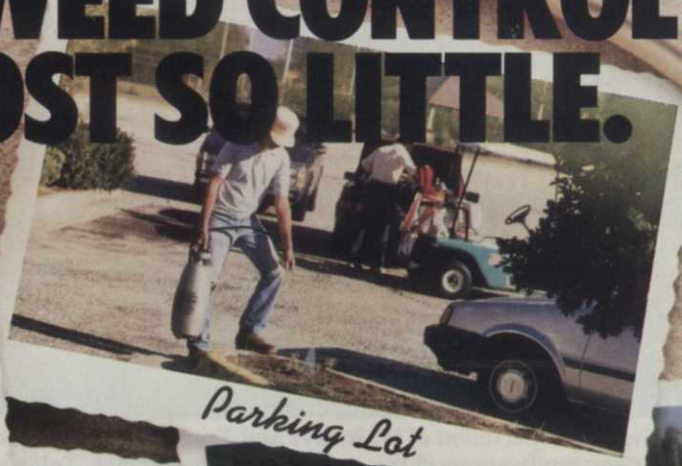
New Lower Price!
Ask your distributor for details

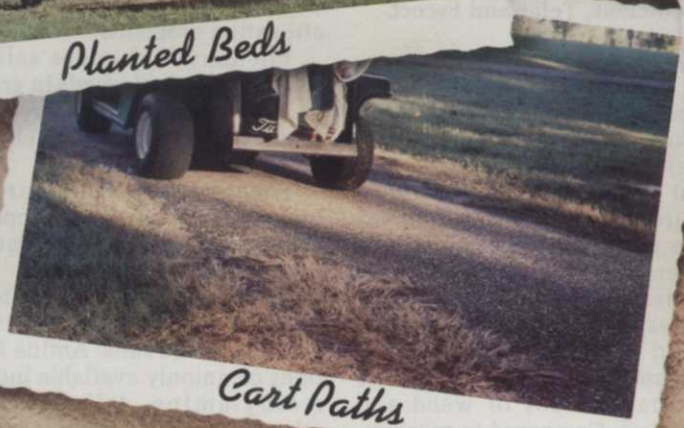
Spot Renovation

Tree Rings

SO MUCH WEED CONTROL NEVER COST SO LITTLE.

Planted Beds


Parking Lot


Cart Paths

Entranceway

All around the golf course, Roundup® herbicide is as versatile as it is affordable. Just one application can take the place of six string trimmings over the course of a season. Even turf renovation is an inexpensive project with Roundup.

ROUNDUP WILL SAVE YOU TIME AND MONEY ALL AROUND THE COURSE.

Dollar for dollar, Roundup can give you better weed control–with less labor–than time-consuming mechanical or hand weeding. In one shot, you can control over 110 broadleaf weeds and grasses, more than 35 brush and hardwood species–even poison oak and kudzu. Roundup controls them roots and all, so they won't grow back.

This season, give Roundup more of the dirty work, wherever weeds appear. And give your men more time to keep the greens, fairways and other high-visibility areas looking their best.

*Based on cost of one gallon of 2% spray solution of Roundup alone to treat low growing vegetation.

FOR A FREE ROUNDUP TRIMMING & EDGING GUIDE, CALL TOLL-FREE 1-800-621-5800.
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ALWAYS READ AND FOLLOW THE LABEL FOR ROUNDUP HERBICIDE. Roundup® is a registered trademark of Monsanto Agricultural Company

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AFFORDABLE

EFFECTIVE

Monsanto

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The Virginia Department of Highways and Transportation was conducting comparison applications of two new Du Pont herbicides, Telar and Escort, when this photo was taken.

large trees by pushing or pulling the plants out with as much of the roots intact as possible. Special attachments to the straight blade include teeth or U-shaped "stingers" to allow cutting the plant off below the ground line and lifting out the roots.

Dozing is most commonly practiced in open stands of large trees and brush or on rocky soils where other mechanical control methods are limited. It is not desirable in dense stands of brush that sprout from the roots after top removal.

Dozed trees can be windrowed or stacked so the brush can be burned or left to decay. The equipment and fuel required for dozing are costly. Dozing heavily damages the turf and grounds.

Mowing and shredding are temporary control methods for weeds and small brush in landscape management. Repeated mowing, once or twice a year, is needed for maintenance on most weed-infested areas.

Mower types vary, but most consist of sharp rotary blades. Heavy duty shredders can be used on large brush and small trees, three to four inches in diameter.

Disking. Large disk plows or tandem disks will destroy stands of small brush. They may also destroy the grass stand. Disking is limited to tillable soils. Disking prepares a good seedbed, although compaction by a cultipacker, roller, or other implement may be desired. The operation is expensive.

Cost of mechanical treatments is usually closely correlated with degree of soil disturbance and size and density of brush to be removed. Dozing, disking, and grubbing are among the most effective mechanical brush control treatments, but are the most costly to perform, while mowing is less expensive. Hand methods, such as sawing, axing or grubbing, are sometimes effective, but are slow, costly, and laborious.

Chemical Control. Herbicides are an important means of weed and brush control. Compared to mechanical practices, herbicides are usually less expensive, less damaging to the environment, and often more effective.

Herbicide sprays, however, are subject to drift and may damage susceptible crops or valuable vegetation on nearby areas if improperly applied.

A variety of herbicides and herbicide combinations are commercially available. It is necessary to understand the properties and effects of herbicides in order to safely and effectively use them.

Individual herbicides and combinations of herbicides are used for weed and woody plant control. After manufacturing, technical (pure) herbicide must be formulated with other ingredients to prepare usable products for ease of handling and to obtain the desired effects.

Since very small amounts are sometimes required per unit of land, uniform application is esential. Herbicides are formulated as liquid concentrates, wettable powders, and granules or pellets. It is important to know the characteristics and precautions to be taken when using herbicides.

Characteristics of herbicides

Phenoxy herbicides, such as 2,4-D, 2,4-DB, dichlorprop, and MCPA have been used for over 30 years and are effective for the control of many weed and brush species. They are used to produce changes and shifts in plant cover for crops, pastures, lawns, or wildlife habitat.

The phenoxys are not toxic to livestock or man at dosages labelled for weed control and disappear rapidly from the soil, vegetation, and water. They do not accumulate in the food chain.

Susceptible vegetation, especially broadleaf plants, may be damaged from spray drift or from volatilization. Following label instructions and making applications during favorable weather should prevent drift and volatilization problems.

Phenoxy herbicides selectively control broadleaf weeds in grasslands or grass crops. Rates of 0.25 to 2 pounds per acre effectively control many broadleaf plants.

Phenoxy compounds are relatively inexpensive and easy to apply. They are usually marketed as liquid concentrates as salts or esters.

Ester formulations are often more effective as foliar sprays on trees and brush than the salts. Amine formulations commonly available include dimethylamine, triethymine, diethanolamine, trimethylamines, triethanolamine, and others.

Other inorganic salts of the phenoxys that have been sold include the ammonium, sodium, potassium, and lithium salts. Salts are sprayed in water carriers.

Esters are classified as high volatile or low volatile, depending upon how readily they vaporize. Low volatile esters should be used in areas where sensitive crops or vegetation are grown.

The concentration of the active ingredient, the "acid equivalent," is indicated on the label as pound-per-gallon. If a herbicide concentrate has an acid equivalent of 4 pounds per gallon, then 1 gallon of the concentrate contains 4 pounds by weight of the parent acid, regardless of formulation. Usually the most concentrated formulations cost less per pound and are more economical to use than weaker concentrates.

Phenoxy compounds are readily absorbed by leaves and are translo-

CITATION II • BIRDIE II • MANHATTAN II

FERRY-MORSE GOLD TAG BRAND COVERS THE 1986 ROSE BOWL

The Rose Bowl at Pasadena, CA, January 1, 1986

New generation perennial ryegrasses provide 'near perfect' playing surface . . . prove older ryegrass varieties to be passé

PASADENA, CA – When the field turf management team for the Rose Bowl specified the perennial ryegrass blend to overseed the 1986 Classic, they chose Ferry-Morse Gold Tag Brand, a blend of Citation II, Birdie II and Manhattan II ryegrasses produced by Turf-Seed, Inc.

To meet demanding time and performance constraints, they opted to use this blend of genetically improved ryegrasses based on performance in prior testing against other varieties and combinations. Gold Tag Blend germinated and established quickly, producing a dark green, durable playing surface that enhanced the playing field graphics and the proud heritage of the Rose Bowl itself.

Based on comments and accolades bestowed in 1986, the turf management team anticipates the use of genetically improved ryegrasses like Citation II, Birdie II and Manhattan II, and Gold Tag Blend in the future.

And it looks like a very bright future, indeed.

The field still looked terrific the day after the game

Citation II, Birdie II and Manhattan II are products of

Turf-Seed, Inc.

PO Box 250, Hubbard, OR 97032
503/981-9571 TWX 510 590 0957

Gold Tag Brand is a product of

Ferry-Morse Seed Co.

PO Box 4938, Modesto, CA 97352
In California, 1-800-572-SEED
209/ 579-SEED

2120 Via Burton, Anaheim, CA 92806
714/ 774-5460

600 Stephen Beale Dr., Fulton, KY 42041
1-800-626-3392 502/ 472-3400

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Now! A Sprayable Turf Green-up

Let us send you a sample of Fe^{++}RROMEC™ so you can see with your own eyes how fast it changes weak-looking dull grass into vibrant, deep-green, healthy-looking grass.

Everett Mealman
President
PBI/Gordon Corporation

As a professional golf course superintendent or groundskeeper, you will immediately recognize the significance of what I am about to say . . .

. . . We at PBI/Gordon have been quietly testing our patented Ferromec under a wide variety of growing conditions, and the results are conclusive! . . . Ferromec will not only deliver rapid and dramatic color responses in turf as a result of foliar intake, but will also deliver a therapeutic dose of iron to the turf through root absorption.

It means that now you can have deep, vibrant, healthy green turf without an unwanted overdose of fertilizer which could lead to all sorts of problems and exposure to disease.

No wonder we are so eager to get a sample of Ferromec in your hands. But, meantime, we urge you to take a minute or so to better understand why iron is such an elusive material, and how PBI/Gordon has managed to harness it for you.

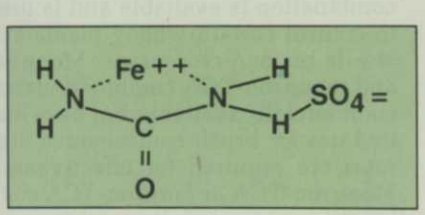
Ferrous Iron is Very Fragile.

As you know, the basic problem of supplying iron to turfgrass is its fragility in the Ferrous++ state. Only Ferrous iron can be utilized by a plant and, *ironically,* almost as soon as Ferrous Sulphate is applied it turns to the non-usable Ferric+++ state. Once oxidized, the reversal with organic matter acting as a reducing agent is so slow there is a question if it would ever occur.

And thus it is that scientists devised chelating, which is intended to fix the iron molecule in the Ferrous state. If chelating is properly done, it is effective.

Half of this green at Hodge Park Golf Course in Kansas City was sprayed with Ferromec and, within 24 hours, the color change was dramatic. Under normal growing conditions, visual response usually occurs between 8 and 48 hours after application. However, if moisture and temperature extremes exist, the response may be slower. Ferromec is also effective on trees, shrubs and herbaceous plantings.

Iron that Produces Within 24 Hours



This is the molecular structure of Ferromec. Note that ferrous sulphate is bonded to a urea molecule and will remain stable. Ferromec utilizes a recombinant urea process to achieve the unique composition. It is classified as an organometallic compound.

But it is very expensive and so slow to release that it could be many weeks before a treatment of chelated iron could produce a significant color change in the grass.

Ferromec Works Right Now!

At PBI/Gordon we have a patented process of bonding a Ferrous iron molecule to a molecule of urea, which stabilizes the iron in a Ferrous state. Notice the diagram above of the Urea/Ferrous sulphate molecule which is called Ferromec.

Ferromec can be mixed with liquid fertilizer and Super Trimec® broadleaf herbicide, and it will not harm the equipment. The Ferromec is almost immediately assimilated so the color change occurs very rapidly. The Ferromec which reaches the ground is taken up by the root system because the grass has such a voracious appetite for the nitrogen content of Ferromec.

Neal Howell Can Answer Your Questions about Iron in Turf

Iron is definitely established as an essential micronutrient required by all plants. Yet, the amount required can vary dramatically depending on the pH of the soil, the composition of the fertilizer that is being used and the plant that is being fed.

To help you better understand how to use iron in your turf program, we have brought Neal Howell into the PBI/Gordon organization as Director of Technical Sales Services of Soil Supplements. He is a leading authority on iron and is as near as your telephone when you have questions.

You'll like Neal. He's a *real Ironman* whose roots go back to the Iron Knights of the "Hell on Wheels" gang of the 2nd Armor Division from Fort Hood (that's General Patton's old bunch).

Ask for Samples of these New Products from PBI/Gordon

Other new products that have been developed and thoroughly tested by PBI/Gordon are Bov-A-Mura,® a patented, natural organic activator that turns thatch into humus; and Transfilm,® a patented year-around plant protector that is up to five times more effective in reducing transpiration, and lasts up to twice as long as conventional plant protectors.

For your free samples of Ferromec, Bov-A-Mura, and Transfilm, write or call . . .

Toll-free 1-800-821-7925
In Missouri 1-800-892-7281
Ask for Customer Service Department.

Inform us of bids to be let.
We furnish detailed specs and names of distributors serving your area.

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Fe++ FERROMEC™

IRON FROM THE TRIMEC® PEOPLE

TURF HERBICIDE

651-1185

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cated throughout the plant along with the products of photosynthesis. Oil soluble formulations, usually esters, appied in kerosene or diesel oil will penetrate the bark of most woody plants, and can be used as basal sprays or foliar sprays to individual plants.

Phenoxy herbicides, however, are more commonly applied broadcast to large areas containing dense stands of brush. These herbicides are sprayed on above-ground parts and foliage since they are not effective at economical rates as soil-applied herbicides.

Organic arsenicals, available as liquid concentrates, include DSMA, MSMA, and cacodylic acid. These compounds have limited use for woody plant control as foliar sprays.

DSMA and MSMA are used for postemergence weed control in tolerant lawn grasses and non-crop areas. Cacodylic acid is used as a general desiccant and defoliant (contact) spray on many crop and non-crop areas.

Organic arsenicals can be used for quick dieback of woody species, but plants tend to recover. They can be injected into the trunk to kill unwanted trees. As foliar sprays, they are applied in water. Complete coverage by spray is required for best results. They are inactivated by soil contact.

Organic arsenicals may injure desirable plants. By directed spraying, desirable plants can be avoided. Organic arsenicals have a moderate to low mammalian toxicity but are highly toxic to insects such as honey bees. They are mildly corrosive to spray equipment.

Bipyridyliums. Diquat and paraquat are desiccant (drying agents) and defoliant herbicides used for general contact activity against weeds and brush. In some situations, they are used as selective herbicides.

Paraquat is water soluble and is inactived by soil contact. Woody species will usually re-sprout from foliar sprays of diquat and paraquat. Paraquat may be more effective as an injection treatment against some undesirable trees.

Paraquat is highly toxic when ingested. Extreme care must be taken to avoid breathing the spray mist or getting the concentrate on the skin. Use of protective clothing and respirators are recommended when making applications.

Get immediate medical care in the event of ingestion. If treated within 12 hours, chances of survival are excellent.

Benzoics. Dicamba is a selective translocated herbicide. It controls many broadleaf weeds in pasture crops and turf and some woody plants.

Dicamba is similar to the phenoxy herbicides in activity and use. It is absorbed through roots, as well as foliage. It may be applied by either ground or aerial sprays or as granules, depending upon the weeds to be controlled and their proximity to susceptible crops.

Dicamba may be applied in mixtures with 2,4-D to broaden the spectrum of weed species controlled. It has a low order of toxicity to wildlife, fish, livestock, and humans. It rapidly degrades and does not accumulate in the environment. Dicamba has a low corrosion hazard to spray equipment.

It is formulated as a liquid as the dimethylamine or sodium salt and is sprayed in water carrier. It is also formulated in granular form as the acid.

It is essential that problem plants be accurately identified so the proper control methods can be used.

Dicamba is highly water soluble. Care must be taken to prevent its movement into water sources. Spray drift of dicamba to sensitive crops, conifers, and certain woody plants should be prevented. Granular formulation may be preferred where drift of sprays would present a hazard to crops.

Dichlobenil is also a benzoic. It is a selective herbicide for control of annual and perennial grasses and weeds in non-crop areas. Dichlobenil inhibits weed seed germination and plant cell division at the growing points.

Because of its relatively high volatility, application when the temperature exceeds 70 degrees Fahrenheit must be followed by a quarter-inch irrigation or rainfall soon after. Downward movement of active ingredient does not exceed two inches, so deeper-rooted woody ornamentals will not be affected. The control is achieved from a chemical barrier in the top one to two inches of soil.

Ureas and uracils. These compounds include bromacil, diuron, fenuron, fenuron-TCA, monuron, monuron-TCA, tebuthiuron, and hexazinone.

Ureas and uracil-type herbicides can be selective at low rates and nonselective at high rates. They are usually formulated as wettable powders for water sprays or as granules or pellets for dry application.

Bromacil (a uracil) will control a wide variety of woody species. If rates above 5 pounds per acre are used, it will also kill many desirable grasses and forbs on grazing lands.

Fenuron is no longer produced commercially, but a fenuron-TCA combination is available and is used to control certain woody plants and weeds on non-crop areas. Monuron and monuron-TCA combinations are commercially available, but have limited use for brush control since high rates are required for effectiveness. Monuron-TCA or fenuron-TCA combinations are generally used for nonselective, temporary sterilization in non-crop areas.

Tebuthiuron provides excellent control of a variety of undesirable woody plants. Tebuthiuron is formulated as pellets and contains 20 percent active ingredient. "Brush bullets" containing 13.8 percent active ingredient are available for woody plant control. Several new formulations are availabe including an 80 percent wettable powder for total vegetation control.

Hexazinone is a relatively new compound showing promise for woody plant control and use on non-crop areas. Hexazinone is recommended for forestry site preparation and pine release where loblolly, long leaf and short leaf, slash, and Virginia pines are grown.

The pelletized product can be spread in a grid pattern for hardwood brush control. It also shows promise for total vegetation control including perennial grasses. It is highly water soluble. Hexazinone is also commercially available as a liquid that can be applied undiluted near the base of woody plants with a hand-grown applicator.

The ureas and uracils mentioned are absorbed primarily through the roots of plants. They may be applied in spring or fall when weeds and brush are actively growing and when adequate rainfall leaches them into the soil.

Fall, winter, and early spring applications of tebuthiuron and hexazinone can be timed to reduce injury to forage plants and eliminate hazards of drift. These compounds may kill trees at a considerable distance from the point of application, depending upon the size of the root system and whether it extends into the treated areas. Therefore, extreme care should be taken near desirable trees.

"NISSAN TRUCKS MAKE ME MONEY BY SAVING ME MONEY."

Leslie Fields, Owner, Tropical Plaza Nursery, Orange, CA

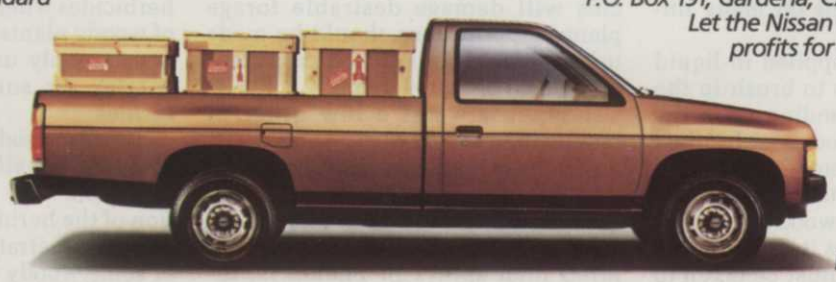
Profits. That's the bottom line of any business, and the more money you can save the more profits you can have. Which is why Leslie Fields relies on Nissan Trucks. In Leslie's words, "The reliability is excellent. Really excellent. We have twelve 1984 and 1985 Nissan Trucks and we're not easy on them. Our trucks get a real workout. Their average load is close to a ton. But no matter how hard we push them they just never complain. Wish I could say the same for my other employees."

If you're looking for a truck that's long on reliability and savings, take a look at the Nissan E Long Bed 4x2. There's 88 inches of double-steel-wall bed, plus the largest cargo volume area of any leading standard compact. And to make loading and unloading the big loads easier, there's a standard removable tailgate with a new quick release feature. Plus, under the hood, this Nissan features a fuel-injected, 2.4-liter, twin-spark hemi head that delivers all the power you need to get the tough jobs done.

Like all Nissan Trucks, the E Long Bed is backed by an outstanding 24-month/25,000-mile limited warranty on powertrain components. Ask your Nissan dealer for further details. And, participating Nissan dealers now offer Security Plus,® an extended service program with term options ranging up to 60 months/100,000 miles and no deductible.

For more fleet information see your local Nissan dealer today or contact our National Fleet Sales Department at Nissan Motor Corporation in U.S.A., 18501 South Figueroa, P.O. Box 191, Gardena, CA 90247.

Let the Nissan E Long Bed help build profits for you, just like it's been doing for thousands of business people like Leslie Fields. The quality is great. The name is Nissan.



BELT YOURSELF

NISSAN E LONG BED

THE NAME IS NISSAN

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Ureas and uracils are non-volatile and do not corrode equipment. Most urea and uracil herbicides can be injurious to some forage and turf species when applied broadcast, especially as sprays. Applying herbicides as pellets or balls to confine the herbicide to a few spots in the treated area reduces exposure to desirable forage or turf plants. Also, application of granules, pellets, or sprays to the soil surface or sprays applied subsurface in rows or bands spaced 6 to 10 feet apart may reduce injury to forage or turf and may increase kill of some woody plants.

Most of the ureas and uracils persist in the soil for several months at rates used for brush control. They are low in toxicity to warm-blooded animals.

Other organic herbicides

Arsenal (AC 252,925) is a new broad spectrum herbicide with activity against herbaceous and woody plants. It controls sedges, grasses and broadleaf weeds applied either preemergence or postemergence.

Arsenal is readily absorbed through foliage and roots. Complete kill may take several weeks.

Most herbaceous weeds are susceptible to Arsenal at rates of 0.4 to 1 pound per acre whereas woody species may require higher rates of 0.75 to 3 pounds per acre depending upon species to be controlled.

Arsenal is being tried experimentally for conifer release and weed control in bermudagrass. Arsenal should be applied postemergence to perennial weeds when they are actively growing and the herbicide is readily translocated.

It has a low order of toxicity to warm-blooded animals. It persists for 3 to 12 months in the soil depending upon rate applied and soil moisture content.

Picloram is a selective, translocated herbicide that effectively controls many weed and brush species in grasslands. It can be applied to the soil or foliage and is effective as injection/cut-surface treatments on many undesirable trees.

Picloram can be applied in liquid sprays and as pellets to brush in the spring and fall, depending upon the species to be controlled. It is absorbed by both foliage and roots. Most perennial grasses are resistant. Its high activity against many woody plants at moderate rates makes it desirable for brush control. Care must be taken to prevent drift of picloram to desirable plants.

Picloram is relatively persistent in soil, especially in cooler climates. Since it is water soluble, care must be taken to prevent its movement into water used for irrigation. It should not be applied where it can be leached or moved to sensitive plants by rainfall.

Picloram has a low mammalian toxicity and is only slightly corrosive to spray equipment.

Triclopyr (Garlon) is a relatively new selective postemergence herbicide for use on rights-of-way, industrial and forestry sites, and experimentally for rangeland brush control. It can also be used to kill trees and brush by injection/cut-surface treatments.

It is readily translocated in plants and is moderately toxic to warm-blooded animals. It degrades rapidly in the soil.

It is necessary to understand the properties and effects of herbicides in order to safely and effectively us them.

Ester formulations are available.

Glyphosate is a non-selective herbicide effective against both grasses and broadleaf plants.

Glyphosate is readily translocated from leaf and stem tissue to roots, resulting in a high degree of kill on many weeds. It is inactivated by contact with the soil and should not injure newly-seeded plants in treated soil.

Glyphosate is sprayed in water carrier. It is presently registered for use for non-crop and pre-till weed control and as a directed spray for orchards, plantations, Christmas trees, and many other crops. It is corrosive to some equipment.

Broadcast sprays over woody species will damage desirable forage plants. Applications should be made to individual plants on non-crop areas or areas to be renovated.

Glyphosate has a low order of mammalian toxicity.

Amitrole is effective against poison ivy and poison oak. If amitrole is accidentally sprayed on desirable plants, they are less likely to be severely injured than sprays of phenoxys, dicamba, or picloram.

Amitrole is available as a powder containing 50% active ingredient or as a liquid formulation. Another formulation, Amitrole-T, contains 2 pounds per gallon of ammonium thiocyanate in addition to 2 pounds per gallon of amitrole.

Amitrole is effective through the roots and tops of plants. Amitrole cannot be used where there is any possibility of residues on food or feed crops.

Fosamine (Krenite) applied as foliar spray will kill or suppress several different woody species on non-crop land. If it is applied to trees or brush in late summer or early fall, susceptible species will fail to leaf out the following spring and subsequently die.

Rates of 1½ to 3 gallons of fosamine are applied per acre during the two month period before fall leaf coloration. If rainfall occurs within 24 hours of application, effectiveness may be decreased. Use only in accordance with recommendations on the label. Fosamine cannot be used on cultivated land or in pastures.

Inorganic herbicides

Ammonium sulfamate (AMS, Ammate) is a non-selective herbicide used extensively to kill all plants growing on rights-of-way.

AMS kills trees. It can be used as a foliage spray or in cuts through the bark. When applied to stumps, it prevents sprouting. AMS kills or supresses herbaceous plants as readily as woody plants.

It is corrosive. Spray equipment should be cleaned immediately and coated with diesel oil or similar light oils after use.

Oils Diesel oil and kerosene are commonly used to control honey mesquite and huisache. One cup to 1 gallon of oil is used per tree, depending upon its size. The oil is applied around the base of the tree during dry weather when the soil is pulled away from the trunk. Application at this time enables the oil to penetrate to the lower buds on the stem.

Oils alone are not very effective herbicides when applied to the foliage of woody plants. However, diesel fuel is commonly used as a dilutent and carrier for some oil soluble herbicides.

It is also used as a carrier in aircraft spraying, usually as a 1:4 oil-in-water emulsion. The oil reduces evaporation of the herbicide in arid areas and aids in penetrating stems and foliage of some woody plants. Water carrier, however, is equally as effective as oil carriers in some situations, such as use of 2,4-D on sagebrush. **WT&T**

Scotts ProTurf.

That's an exceptionally strong statement, Ray. But let's start with the product. Is it something new? "We're talking about pre-emergent turf herbicide products using pendimethalin, and this is the first time they've been widely available to lawn service companies."

And you can back up that statement about Scotts® pendimethalin products being the best? "I sure can... with over six years of extensive formulation and field research."

What makes pendimethalin so good? "Its broad-spectrum action. Look at all of the tough grassy weeds it controls—crabgrass, goosegrass, foxtail, barnyardgrass, fall panicum, and *Poa annua*."

What broadleaf weeds does it control? "Oxalis, prostrate spurge, chickweed, cudweed, hop clover, henbit, and eveningprimrose. And soon we may be able to add to that list."

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That sounds good, but how long does it last? "It provides excellent residual activity... four to five months for most weeds when properly applied."

How many species of turfgrasses can I use pendimethalin on? "Right now, it's labeled for use on nine species of established cool and warm season turfgrasses."

What forms does it come in? "Four. In addition to water-dispersable granules, we also offer three exclusive ready-to-use dry-applied products—a fertilizer/pendimethalin combination and two straight pendimethalin products—one for cool-season grasses and one for warm-season grasses."

And how much does it cost? "On a square-foot basis, the price is very competitive. Factor in the broad-spectrum action and residual... which should reduce callbacks... and Scotts pendimethalin products become an unbeatable value."

For more information about pendimethalin turfgrass herbicide, call Scotts Lawn Care Service Supply Division at 800-543-0006. In Ohio, call collect 513-644-2900.

"You can't get better pre-emergent control of grassy and broadleaf weeds... or a better value."

Ray Huey, Scotts project leader (Herbicide Research and Development), talks about **Scotts pendimethalin-based turf products.**

Ornamentals can increase the beauty of any landscape.

WEED CONTROL IN THE LANDSCAPE

by Elton Smith, Ph.D., Ohio State University

An increase in the use of trees, shrubs, ground cover, and herbaceous plants in commercial and residential landscapes has caused a corresponding increase in use of both pre-emergence and post-emergence herbicides in landscape maintenance.

The landscape manager has to control weeds around a variety of desirable plant material, including deciduous and evergreen shrubs, trees, groundcovers, annual and perennial flowers, bulbs, and ornamental grasses. These plants are located in a wide variety of locations, such as plant beds, containers, greenhouses, atria, and even in sand traps.

Attention to the label is especially important in ornamental weed control due to the varying sensitivity of plants to herbicides. Manufacturers attempt to provide products safe to the largest possible number of species.

Before planting

The most successful approach to a weed-free landscape is to control perennial grasses and broadleaf weeds prior to planting.

Spraying the weeds in the planting area with post-emergence systemic herbicides will kill the root system as well as the topgrowth.

Such herbicides include 2,4-D and related products for broadleaf weed control, dalapon for grass control, and amitrole for general weed control. These may have to be applied more than once for complete kill.

Each has a specific waiting period prior to planting. Highly-used glyphosate is very effective and has no soil residue.

Fumigation of plant beds is another alternative.

Vapam is one of the simplest fumigants to use. It is applied and watered into the soil. The water seals the surface, but plastic can also be used to cover the bed after the fumigant is applied and watered in.

The fumigant will also kill insects and some fungi detrimental to plants. Planting can take place within days following treatment.

Fumigants and non-selective herbicides will kill desirable plant material contacted by them. Care must be taken to protect nearby trees and shrubs.

A number of pre-emergence herbicides are labelled for ornamentals and two are recommended for use prior to planting.

Eptam or Treflan can be incorporated into the soil, following tillage, to control annual and some perennial weeds for a period of four to six weeks.

Following incorporation to a depth specified on the label, ornamentals can be planted.

What is so rare as a day in May? Especially with no leaf spot.

Leaf spot. It's a spoiler. Give it half a chance and it'll go after your grass.

To protect the beauty and playability of your turf from leaf spot, get new ®DYRENE 4 Turf fungicide.

Now available as a flowable, it is not only easier and cleaner to use, but much more economical, too. For control of leaf spot, DYRENE 4 can be applied at *half the rate* of DYRENE wettable powder, yet will provide *twice the residual.*

DYRENE has always been an essential part of any complete program of disease control. Now, it's economical, too. Always read the label before use.

DYRENE.
IT STOPS THE SPOILER.

MOBAY

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WEED CONTROL GUIDE

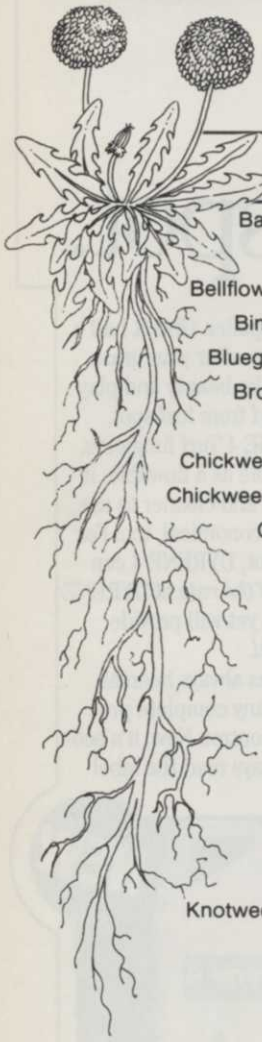

CHART 1

Growth and treatment periods

Weed	SPRING			SUMMER			FALL			WINTER		
	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late
Barnyardgrass												
Bedstraw												
Bellflower, creeping												
Bindweed, field												
Bluegrass, annual												
Brome, smooth												
Carpetweed												
Chickweed, common												
Chickweed, mouseear												
Clover, white												
Crabgrass												
Dandelion												
Deadnettle												
Dock												
Fescue, tall												
Foxtail												
Garlic, wild												
Goosegrass												
Henbit												
Ivy ground												
Knotweed, prostrate												
Kochia												
Mallow												
Medic, black												
Moss												
Nimblewill												
Nutsedge, yellow												
Pigweed, prostrate												
Plantain												
Puncturevine												
Purslane, common												
Quackgrass												
Sanbur												
Shepherdspurse												
Sorrel, red												
Speedwell												
Spurge, prostrate*												
Thistle, Canada												
Thistle, musk												
Vervain, prostrate												
Violets												
Waterleaf (nyctelea)												
Woodsorrel, yellow												
Yarrow												

Active period of plant growth. Varies from year to year and from north to south.

Apply preemergence chemicals.

Apply postemergence treatments. Approximate periods may vary two weeks from season tc season.

*Preemergence herbicide applications should be made a second time in late June or early July.

THE RYAN AIRE FORCE.

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The HUSTLER Hi-Lift BAC-VAC attachment and drive-wheel steering saves time and labor costs, plus you cut more grass faster with a finer cut than any other mower in its class.

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Circle No. 124 on Reader Inquiry Card

Weeping hemlock (left) and weeping crabapple adorn a patio area.

This method has been used extensively by commercial nurserymen and is now being used by landscape contractors to a large extent, especially where maintenance for a specified period of time is in a planting contract.

Tillage as a method of weed control prior to planting is a successful practice for the control of annual weeds but not perennial weeds. In some cases, tillage only cuts up the root systems of perennials into smaller pieces and distributes them.

After planting

In recent years, the landscape industry has made extensive use of mulches to prevent weeds in the landscape. Mulches should be applied two inches deep and renewed to that depth annually.

Mulch layers deeper than two inches accomplish little and actually harm shallow-rooted ornamentals which will root into the mulch instead of into the soil.

The most popular mulches are hardwood, pine, and cypress barks, as well as wood chips, peat moss, and various hulls. Materials which are not composted or inorganic can rob the soil below of important nitrogen.

An application of one pound of actual nitrogen per 1,000 sq. ft. will offset the nitrogen draw from the soil or organic mulches.

Landscape fabrics are growing in use for low maintenance areas. The fabrics have been improved and are useful in mulched beds where plants are spaced out. They are impractical for groundcover areas and they do not control germination of weed seeds in the mulch above the fabric.

Pre-emergence herbicides can be used in combination with mulches to stop germination of weed seeds in the mulch or those deposited by birds and wind. They control annual weeds for a period of four to eight weeks. Reapplication is usually necessary for season-long control.

Determine the amount of pre-emergence herbicide to be applied by figuring the area of the plant bed, measuring the proper amount for that area, and distributing it evenly in the area.

WT&T

MARKETING AND BUDGETING • VALUING A LAWN SERVICE COMPANY
SALES TRAINING • DEVELOPING AN ADVERTISING PLAN

1986 PLCAA ProManager Seminar Series Focuses on Growth and Profitability

FACULTY

John Linkhart
Currently the owner/operator of Hart's Lawn Service as well as a senior consultant for AGMA, Linkhart was formerly the V.P. Operations for Perf-A-Lawn. He has been involved in every aspect of operations from both the standpoint of an owner as well as operating his division for a major national company.

Rudd McGary
A senior consultant with AGMA, Dr. McGary was formerly on the marketing faculty at Ohio State. He has been involved with marketing and management in the Lawn Care Industry for eight years, helping design both marketing and management systems for a wide variety of over 50 companies in the industry.

Bob Robinson
Robinson is a senior consultant with AGMA as well as running his own mulch company. Formerly Robinson was in charge of all agronomic programs for Chemlawn, which included both the selection of materials as well as assessing operating costs.

Ed Wandtke
Currently a senior consultant with AGMA, Wandtke was the Corporate Finance Manager for Chemlawn. A CPA, Wandtke works primarily in the areas of finance and accounting for AGMA with a broad-based background in all operating areas of lawn care.

The Professional Lawn Care Association of America announces the 1986 PLCAA **ProManager Seminar Series.** This new seminar series . . .

- Directly applies to your **growth**, your **profitability**.
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The four separate seminars are:

MARKETING AND BUDGETING

- **Dallas — January 6 - 8**
- **Newark — January 9 - 11**
- **Atlanta — January 13 - 15**
- **Cincinnati — January 16 - 18**

This intensive two and one-half day seminar gives attendees a solid foundation in professional, proven methods for the ownership/management of a lawn service company. Course highlights include: • The Importance of Planning • Corporate Philosophy and Management • Marketing and Sales Planning • Sales Projections • Customer Retention • Cash Management • Budgeting Preparation • Cash Flow Statements

VALUING A LAWN SERVICE COMPANY TO BUY OR SELL

- **Chicago — January 23 - 24**
- **Atlanta — February 3 - 4**
- **Philadelphia — January 20 - 21**

Thinking of buying or selling a lawn care business? This two-day program offers professional guidance on how to get the maximum return when you sell, or the most for your money when you buy. Subjects covered include: • Planning to Buy or Sell • Evaluating a Company • Developing a Buy or Sell Strategy • How to Recognize an Opportunity • Determining a Price

SALES TRAINING FOR THE LAWN SERVICE PROFESSIONAL

- **Baltimore — February 10 - 12**
- **Chicago — February 19 - 21**
- **Detroit — February 26 - 28**
- **Sturbridge, MA — March 3 - 4**

Not a "natural born" salesman? Learn how to be something better — a professional salesman. This two and one-half day seminar supplies a solid understanding of the sales process and how to work with customers effectively. Among the subjects covered: • Marketing and Sales Preparation • Sales Psychology and Theory • Interviewing • Motivation • Closing a Sale

DEVELOPING AN ADVERTISING PLAN

- **Atlanta — January 20 - 22**
- **Chicago — January 27 - 29**

Effective advertising is crucial to success in the lawn care business. The objective of this two and one-half day seminar is to equip the owner/manager of a small lawn care company with the knowledge for making sound decisions in the advertising marketplace, including cost-effective choices and generating the highest response per dollar spent. Subjects covered include: • Choosing the Right Medium • Costs of Various Media • The Importance of Timing • Positioning Through Advertising • Projecting an Image Through Advertising • Consumer Behavior and Advertising

Advance registration: To register, mail the registration form below or call PLCAA at (404) 977-5222.

Arrangements for Attendance: Lunch is included in the registration fee for each full day of the seminar. All other meals and housing are the responsibility of each individual attending the seminar. Travel and lodging information will be provided upon receipt of registration form.

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Please register me in the seminars checked below:

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Seminar fee: **$495** (**$395** if PLCAA Member).
Additional registrants **$200** each.
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Seminar fee: **$595** (**$495** if PLCAA Member).
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DEVELOPING AN ADVERTISING PLAN
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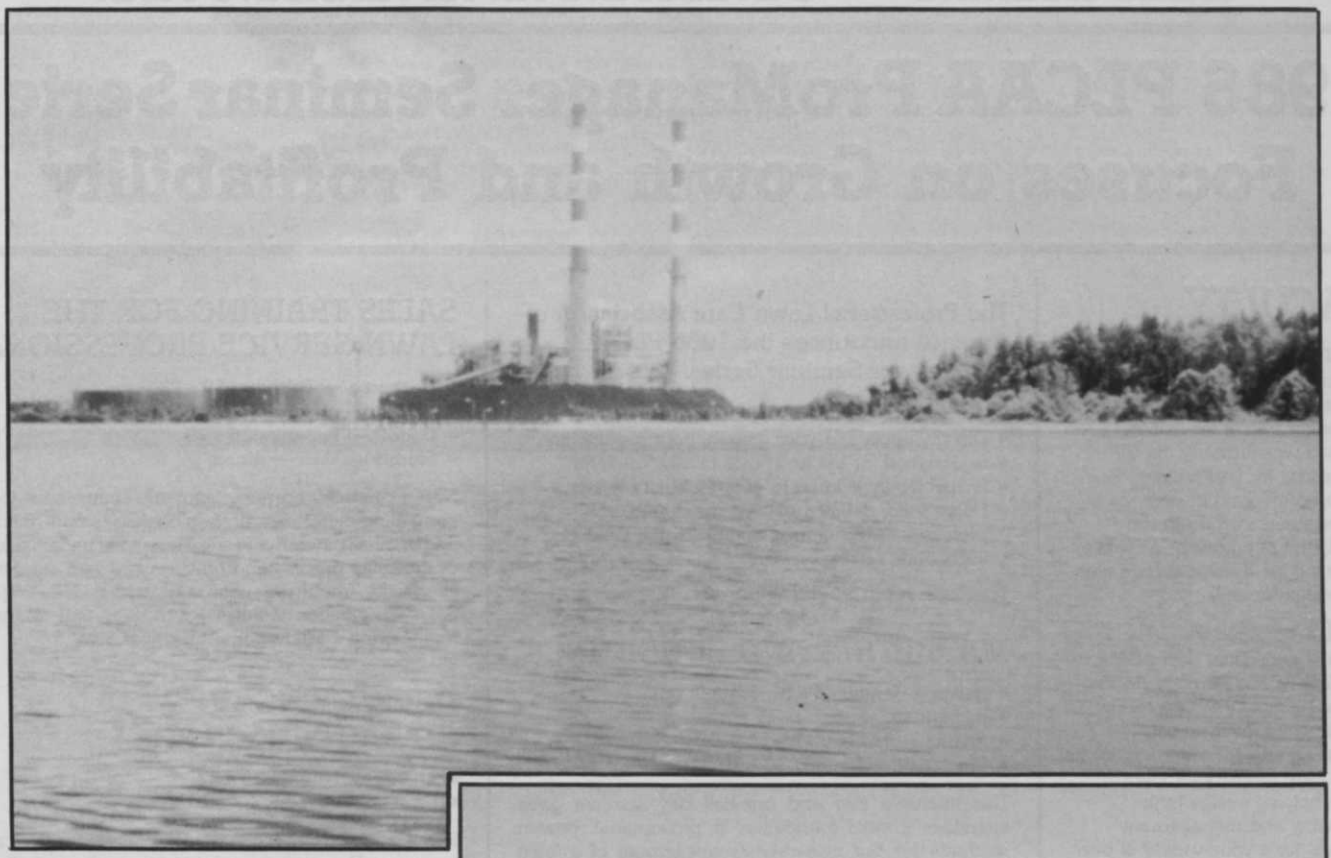
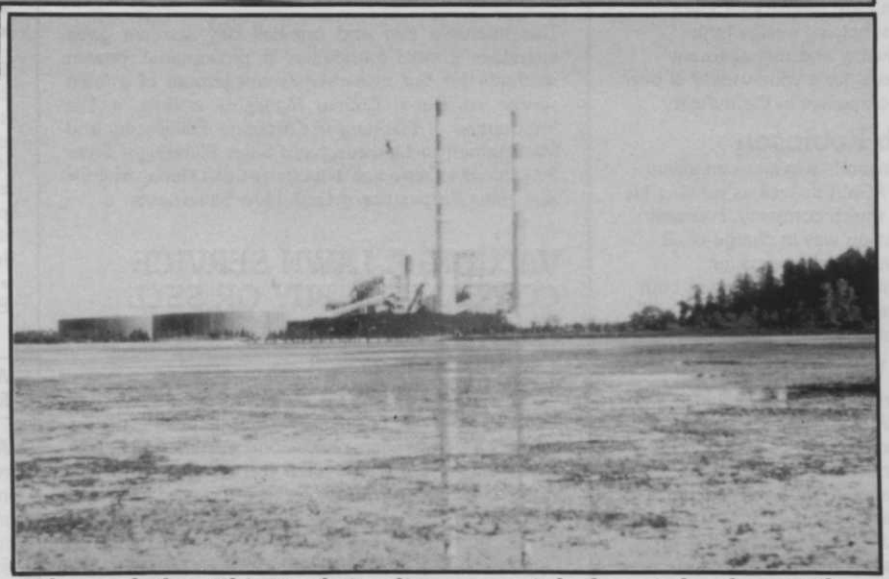


AQUATIC WEED CONTROL

Those nasty water weeds taint the look of any landscape. Effective control is possible. Prudence on the controller's part is the key.



Before and after. This North Carolina reservoir had a naiad and coontail problem (below). Less than one year after treatment with an aquatic herbicide, the problem was controlled (top).

You have this beautiful pond on an area that you landscape but unsightly weeds dominate the water. Water weeds not only destroy the appearance of ponds, lakes, and streams, they also ruin the impact of the entire landscape.

Lagoons, holding ponds, and ditches, although not landscape features, serve useful functions which are inhibited by weeds.

What do you do? Well, first you should check local regulations to make sure your planned control measure is acceptable.

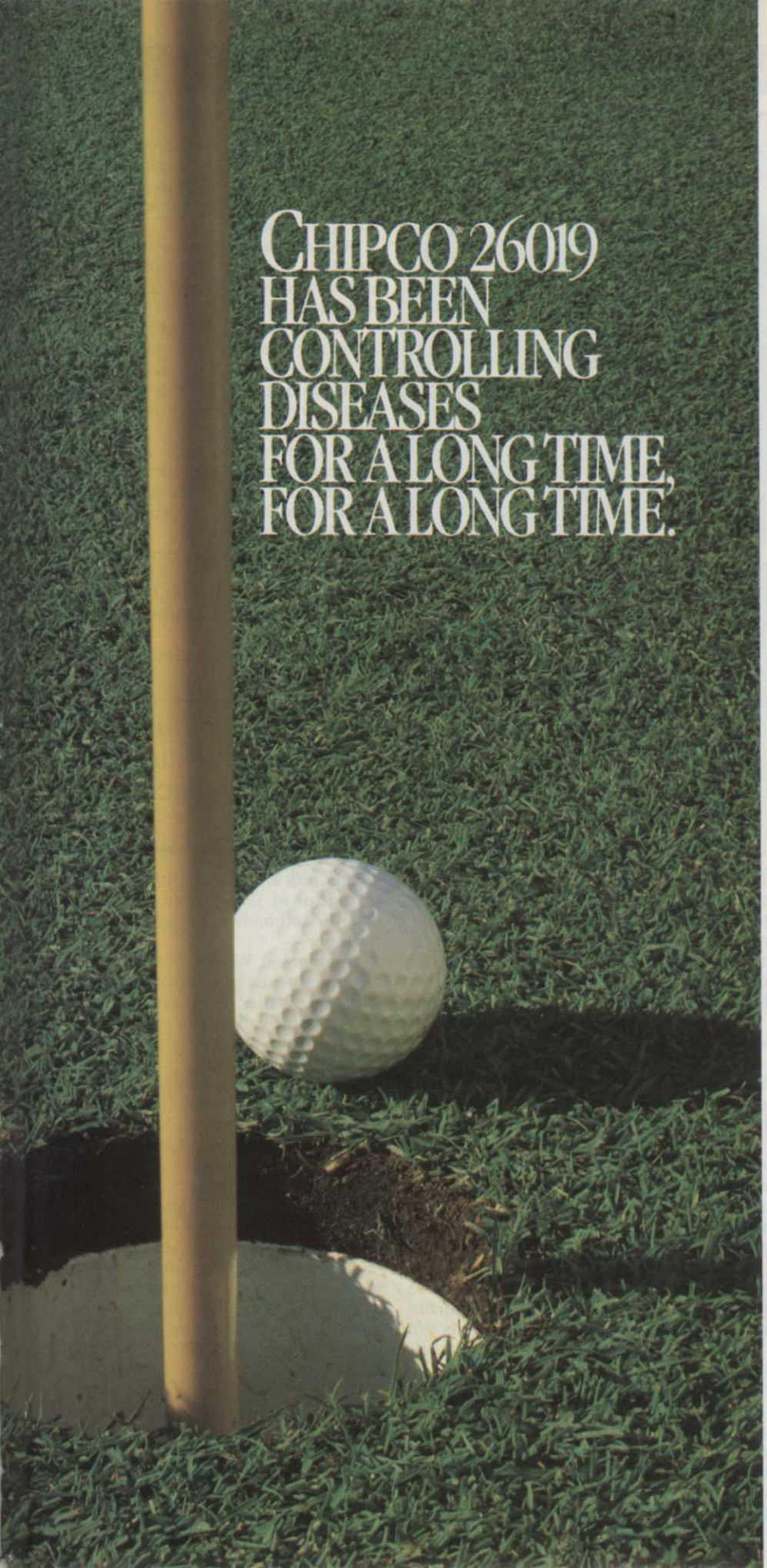
Control measures are limited not only by local regulations, but also by desirable plants in the water, and uses, such as swimming, irrigation, fish farming, and air conditioning.

If a lake is part of a natural watershed area, there may be restrictions on the use of certain chemicals or weed-eating fish. Check with your local extension agent before treating, diverting, draining, or filling in any lake, even if it is on private property.

It should be noted that chemical aquatic weed control is a very difficult science. It may be beneficial to hire a private applicator as the environmental and legal concerns involved are numerous.

Preventative control

Before we discuss chemical aquatic weed control, let's discuss what can be done to prevent weed growth in the first place.



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Add a few extras — no phytotoxicity, low toxicity, pesticide compatibility, and no corrosiveness — and you've got a fungicide that's earned its place as the standard of the industry.

Use CHIPCO 26019 this season and you'll stay with it for a long time to come.

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CHIPCO 26019

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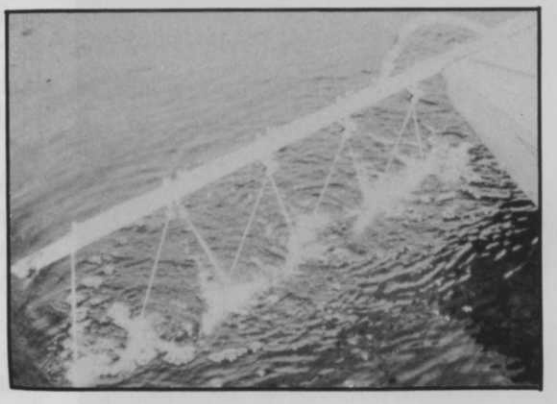
Circle No. 162 on Reader Inquiry Card

Aquatic weeds may reduce or severely restrict water flow (as much as 90 percent) in irrigation canals and drainage ditches.



Application of an aquatic herbicide with a sprayer.

Conditions that may cause an aquatic weed problem are water depth (water less than 8 feet deep is conducive to weed growth), poor circulation of water in the lake and air above the lake, fertilizer runoff, and presence of dead organic material (such as fish, plants, or sewage).

Bottom-rooted aquatic plants require light to grow. The light below 8 feet is inadequate for many aquatic plants. If a lake cannot be deepened, dyes or bottom liners can be added to shade the lake bottom.

Pond aerators add needed oxygen to water and help avoid temperature stratification of water layers. Without mixing, water tends to form layers based on temperature, the warmest layer on top.

By keeping surface water temperatures down through mixing layers, you may discourage algae growth.

Algae does not readily establish until surface water temperature reaches 60 degrees F.

As decaying organic matter removes oxygen from the water, one should avoid throwing debris or clippings into the water. If possible, dead plants should be removed from treated lakes.

Drawdown, or draining to expose aquatic plants to full sun or freezing temperatures, is used where fish or irrigation aren't factors. Dredging and aquatic weed harvesters are expensive and cause a disposal problem, but they may be the only way to get initial control over a serious aquatic weed problem.

Lakes require some vegetation to produce needed oxygen, to provide cover for fish and wildlife, and to appear a natural part of the landscape.

As such, portions of the lake can be kept shallow to provide for aquatic plants.

Another method is to place plants in removable containers, close to the water's surface.

Desirable native plants, such as rushes, are available from specialized nurseries. These container plants can be removed if necessary during treatment periods.

Curative control

Whether in a warmer climate where aquatic weed control is perpetual or in the North where control is needed only seasonally, control is similar.

So is the action of the aquatic herbicide.

Certain aquatic herbicides may be absorbed by roots of nearby trees or plants which extend into the water. Read labels carefully for susceptible land plant species.

Algae. Copper compounds (Cutrine-Plus, copper sulfate) are effective and when used at correct rates, do not restrict water use.

If a lake has a history of algae problems, start using copper compounds as soon as water temperatures get above 60 degrees F. Periodic retreatment may be necessary for season-long control.

Copper compounds are often mixed with other aquatic herbicides for control of a variety of weeds.

Floating Weeds. Floating weeds are either free-floating or bottom-rooted plants, having leaves on the surface.

They include hyacinths, duckweed, water lettuce, floating fern, and salvinia.

The primary herbicides for floating weeds are 2,4-D and Diquat. Sonar (Fluridone) is a broad-spectrum aquatic herbicide pending EPA registration.

Algae does not readily establish until surface temperature reaches 60 degrees F.

Submersed Weeds. Weeds which are bottom-rooted and totally under water are called submersed weeds. They include hydrilla, pondweed, watermilfoil, fanwort, naiad, and coontail.

The primary herbicides for submersed weeds are 2,4-D, endothall (Aquathol K), Diquat, and Sonar (pending EPA registration.) Combinations of endothall and Diquat with copper are often used.

Emersed Weeds. These are weeds growing in shallow areas with stems and leaves above the water surface. They include cattails, pennywort, alligatorweed, torpedograss, and arrowhead.

Primary herbicides for these are Banvel, 2,4-D, dalapon (Dowpon), Rodeo (glyphosate), Sonar (pending EPA registration), and amitrole.

Products registered for aquatic weeds are also the best to use for ditchbank weed control, since there is always a possiblility water containing herbicides in ditches will drift to other locations. Check labels for ditchbank applications. **WT&T**

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Hydraulically controlled from operator's position. Cultivates a full 42 inch width. Cleanly penetrates to 3 inches, depending on soil conditions. Optional Slicing Blades to open the soil with a minimum of turf disturbance.

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Circle No. 127 on Reader Inquiry Card

THE WEED WAR

Those hard-to-control weeds—spurge and oxalis to name a few—can be controlled. Some new formulations show promise in the fight against the die-hards.

The battle continues to rage: lawn care operators vs. "hard-to-control" broadleaf weeds.

These die-hard weeds—wild violets, spurge, oxalis, and ground ivy—cause frustration, customer complaints, and economic loss.

Chemical manufacturers are constantly testing new herbicide formulations to get the upper hand in the battle and LCOs continue to test those new products.

The history of the battle provides a foundation for discussing today's situation.

The history

In the 1960s two herbicides, silvex and 2,4,5-T, were widely used to control difficult weeds. But these products were banned by the Environmental Protection Agency more than a decade ago.

Since the ban, some of the weeds that were effectively controlled by silvex and 2,4,5-T have once again become a major problem.

Dr. Bob Shearman, turf specialist at the University of Nebraska, cites a prime example.

"In the last five to eight years, oxalis has become a more difficult weed to control. That's basically because we lost silvex, which did an excellent job on oxalis," Shearman says. "It took a couple years for that weed to build back up to prominence and now it certainly is one of the major problem weeds."

Until recently, there had been a void in products which effectively control the difficult weed species. However, some new formulations do show promise in putting LCOs ahead of their foes.

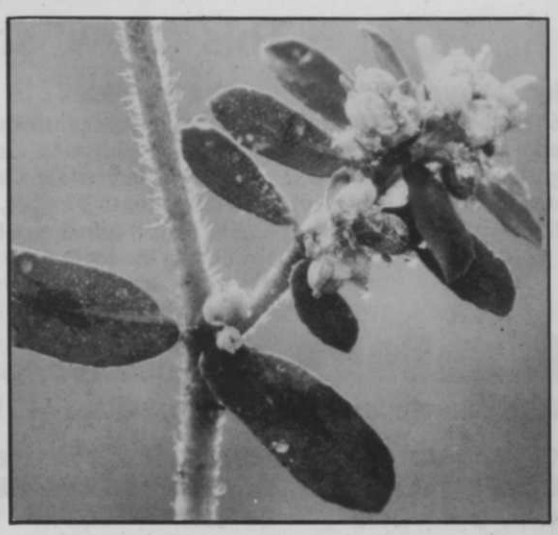
Economic loss

A recent WEEDS TREES & TURF study of LCOs (September 1985) showed poor weed control as a major reason for

Top, the hard-to-control weed, woodsorrel (oxalis stricta L.).

Far left, the wild violet, with its heart-shaped leaves, is another hard-to-control species.

Below, to identify spurge, look for numerous long, creeping stems with oblong leaves opposite each other on the stem.



Cross-country specialist

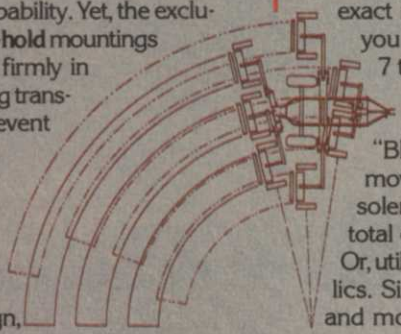
The Jacobsen 5/7 Ram-Lift Ranger covers a lot of territory, with a superior cut from start to finish.

Legendary Jacobsen performance ...to go! The 5/7 Ram-Lift Ranger. Designed for incomparable agility on turf or on the road.

Simply raise the gangs hydraulically to create a sleek, eight-foot transport width that handles narrow service roads and bridges with ease. High-flotation tires and heavy-duty frame give the Ranger true cross-country capability. Yet, the exclusive **steady-hold** mountings keep reels firmly in place during transport, to prevent damage caused by swinging reels.

Utilizing computer-aided design, the frame **steers** reels through turns to eliminate skidding and streaking. Patented hold-down springs enable bi-directional pivoting reels to follow ground contours closely–even at higher cutting speeds, to provide a superior cut.

Tailor the Ranger to suit your application. Choose the exact number of gangs you need to cut swaths from 7 to 15 feet wide. With your choice of reels: six-blade; ten-blade; or five-blade "Blitzer" for high-speed mowing. Our unique electric-solenoid package gives you total control at your fingertips. Or, utilize existing tractor hydraulics. Simply lower the gangs and move out!



The Ranger incorporates CAD-system design for state-of-the-art performance

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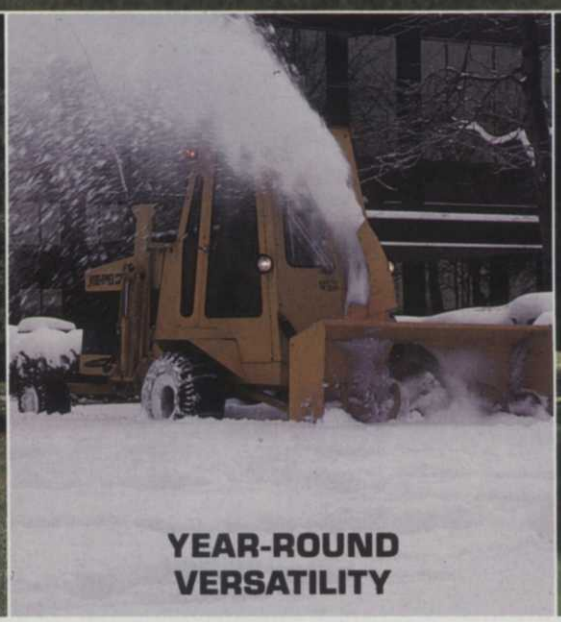
with HYDRO-POWER 180

UNIQUE TRIMMING CAPABILITIES



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Your search for a high capacity mower encompassing a one man operation is now concluded. The Hydro-Power 180 with its 15 foot hydraulically driven rotary mower has a mowing capacity of up to 11 acres an hour while incorporating rear wheel steering for maximum maneuverability. Cutting units are designed for maximum floatation and may be used individually or in any combination of the three.

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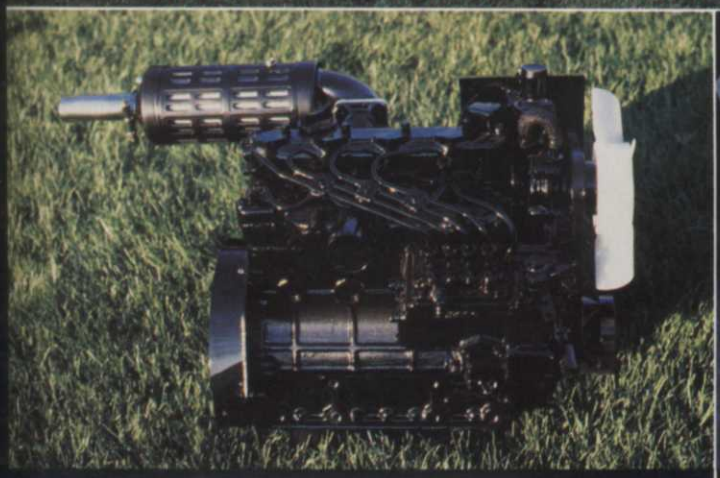
Manufactured by HOWARD PRICE TURF EQUIPMENT **18155 Edison Avenue Chesterfield, Mo. 63017**

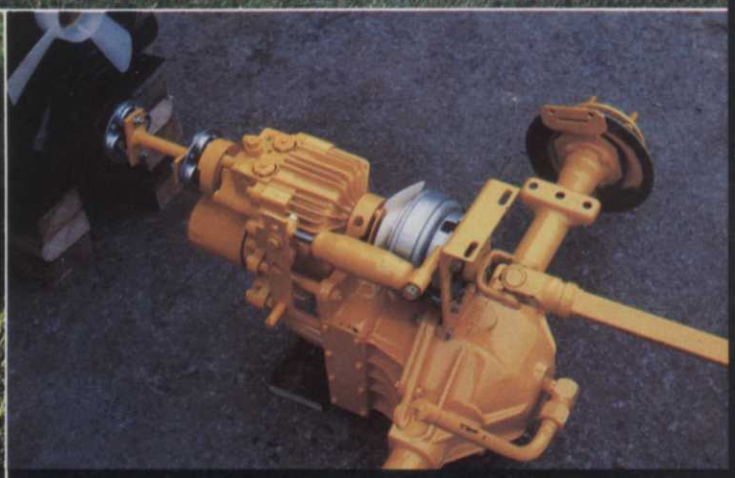
Circle No. 129 on Reader Inquiry Card

NEW TURF BLAZER II

INTRODUCING NEW GENERATION OF DIRECT DRIVE ROTARIES



CHOICE OF THREE WATER-COOLED ENGINES



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The TURF BLAZER II, designed to be a highly productive, mowing machine in a variety of mowing conditions, yet gentle enough to groom the finest lawn.

SELECT the KUBOTA engine to fit your needs.

Choose the 4-cylinder 22HP diesel, the 3-cylinder, 16.5 HP diesel or the 3-cylinder, 21 HP gas. ALL engines are water-cooled.

A new direct drive system to the cutting deck eliminates PTO belts. This direct drive system assures maximum power transfer to the deck. NO belts means NO belt wear and no slippage.

Choose a 48″, 60″, 72″ or 82″ deck. These side-discharge rotaries allow close trimming and uniform discharge of clippings.

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Circle No. 220 on Reader Inquiry Card

customer loss and service callbacks.

Survey respondents said lack of weed control caused 25 percent of their customer cancellations. Only customer relocation, an uncontrollable factor, ranked higher.

In addition, retreatment for hard-to-kill broadleaf weeds was the leading cause of callbacks for two-thirds of those surveyed. The data should tell you that these plants are "weeding" a lot of dollars out of your pockets.

The weeds causing the most problems, according to the survey, were violets followed by spurge, oxalis, and ground ivy.

In order to obtain effective control of difficult weeds, timing is just as important as herbicide selection.

Why they are so tough

Just what makes these plants so indestructible? There are differing reasons, says Dr. Shearman, but some common characteristics are evident.

"To a large extent, these weeds have plant characteristics which make it difficult for the chemical to adhere to the leaf and penetrate the cuticle (leaf surface)," he says.

Waxy leaf surfaces or hairs on the weeds are two characteristics which inhibit herbicide penetration, he says.

Another factor that enters into play is the root system. "Some of the more difficult-to-control weeds, such as the wild violet, are perennials and therefore have an extensive root system," says Dr. Shearman.

"To achieve total kill, you need to control the roots as well as the foliage."

Control may be here

Recent herbicide formulations have shown promise on the hard-to-control weeds.

Manufacturers are producing "low-volatile" ester formulations for post-emergence application. Dr. Bruce Branham of Michigan State University says these herbicides are better able to penetrate the cuticle of the more difficult weeds.

"The low-volatile esters are easier to get into the weed's nutrient and water transportation system than amine formulations," he says. "The result is quicker and better control of roots and foliage on the more troublesome weeds."

One problem with esters been "volatilization," which means the herbicide evaporates into the air after application. When that happens, damage to desirable plants can occur.

The new low-volatile formulations have minimized problems with off-target damage. However, if extremely hot and dry or windy conditions are present then you should use extra caution when applying esters.

Some of the more common ester products include Weedone DPC, Super Trimec, and Turflon D.

Turflon D, from Dow Chemical Company, includes a herbicide molecule which is new to the turf market: triclopyr.

Tony Hall, who is in charge of turf herbicide development at Dow, says triclopyr has been proven to be effective against many of the hard-to-control weeds.

"This is the first truly new herbicide to be introduced to the lawn care market in more than a decade," says Hall.

Timing

In order to obtain effective control of difficult weeds, timing is just as important as herbicide selection.

Explains Dr. Branham: "To get effective weed control through use of postemergence broadleaf herbicides, the plant must be actively growing," says Branham. "That's especially important for weeds which have an extensive root system."

He feels the fall months present the best opportunity for control on difficult weeds. "At that time of year, the weed is storing nutrients in its root system to last out the winter. At the same time, they pump herbicide down to that root system to provide a more effective kill."

An added benefit is that during the fall, the potential for any volatility from ester-based herbicides diminishes.

Temperatures are down and desirable plant species are hardening off for the winter.

By exercising good timing and choosing the right herbicide, LCOs can gain the upper hand against hard-to-control weeds.

Herbicides which incorporate ester formulations have proven to be effective and fall is generally the best time of year to treat broadleaf weeds, perennials in particular.

The economic consequences of improved weed control should also be reemphasized. With so many callbacks and cancellations related to poor weed control, any improvement translates into increased profits. **WT&T**

Tested & Highly Rated Nationwide!

Finelawn 1 Turf Type Tall Fescue proved to be an extremely excellent lawn seed. Its bountiful green color and attractive, narrow tapering leaves were judged high quality. Plus Finelawn 1 demonstrated significant resistance to heat, drought and disease. Tested beauty and toughness -- it's what makes Finelawn 1 an outstanding choice for home lawns, commercial lawns and recreational facilities.

Finelawn 1 TURF TYPE TALL FESCUE

Available at your local Lawn Seed Dealer.

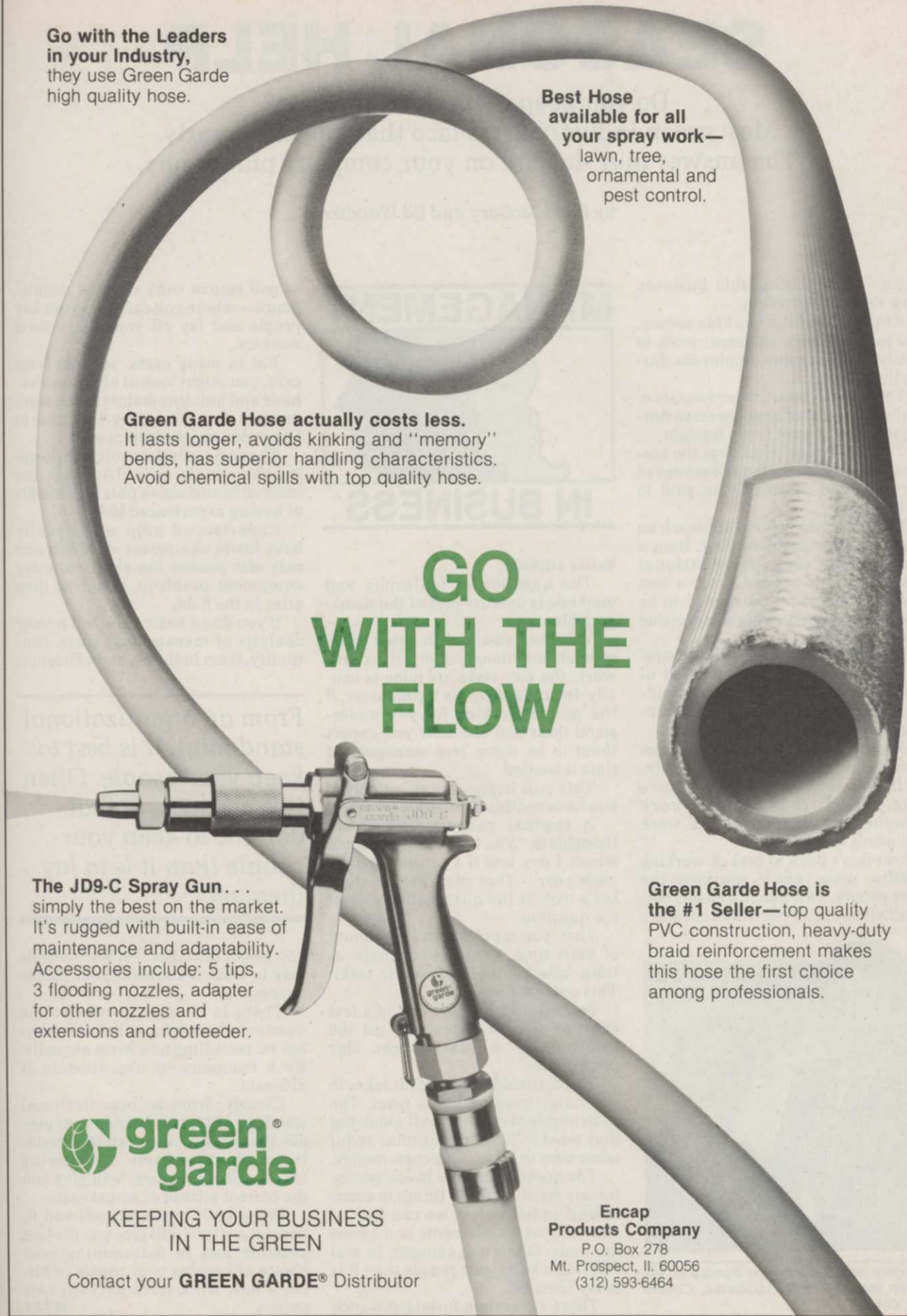
Circle No. 125 on Reader Inquiry Card

Go with the Leaders in your Industry, they use Green Garde high quality hose.

Best Hose available for all your spray work— lawn, tree, ornamental and pest control.

Green Garde Hose actually costs less. It lasts longer, avoids kinking and "memory" bends, has superior handling characteristics. Avoid chemical spills with top quality hose.

GO WITH THE FLOW



The JD9-C Spray Gun . . . simply the best on the market. It's rugged with built-in ease of maintenance and adaptability. Accessories include: 5 tips, 3 flooding nozzles, adapter for other nozzles and extensions and rootfeeder.

Green Garde Hose is the #1 Seller— top quality PVC construction, heavy-duty braid reinforcement makes this hose the first choice among professionals.

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Circle No. 123 on Reader Inquiry Card

SEASONAL HELP

Do you keep them or let them go? Most green industry firms face that question yearly. The answer may depend on your company philosophy.

by Rudd McGary and Ed Wandtke

Anyone in a seasonalable business has a recurring problem.

At the end of the working season, you may not have sufficient work to justify keeping some employees during the off-season.

The issue is not work performance. Rather, the cost of keeping them during the slow season is not feasible.

This is a typical challenge the seasonal business faces today because of the increased compensation paid to all employees.

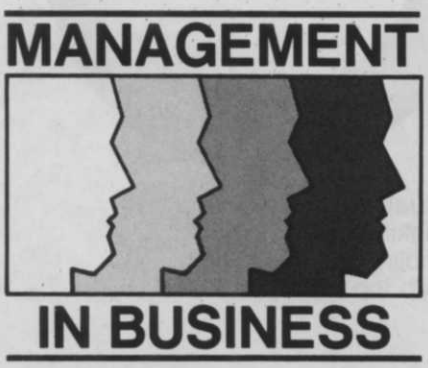
There are two ways to approach an answer to this problem: first, from a management and organizational standpoint, and second, from a cost analysis viewpoint. Both need to be integrated when making the decision on retention.

From the management and organizational viewpoint, the question of continuity of effort and understanding of company methods, and philosophy of operation are the keys.

A work unit's continuity will determine, in many cases, its productivity. If the team has been together for a long period, it is able to work smoothly and understand the work that needs to be done.

You don't have to preach working together each year if you keep the same people. This usually means better efficiency from the work unit and a better attitude.

Wandtke and McGary are owners of All-Green Management Associates, Columbus, OH



The question of philsophy and methods is another part of the managerial issue.

Whether you are in lawn care, grounds maintenance, or golf course work, the way tasks are done is usually determined by the top manager. If the people working for you understand tasks and also how you expect them to be done, less management time is needed.

This will happen more quickly if you have continuity in the work force.

A typical response to these thoughts is, "Yes, but I can find people whom I pay less if I get new people each year." That may not be wise. Let's look at the quantitative side of the question.

First, you must add in the amount of your time needed to manage or train new people to do their tasks. This costs money.

Second, consider the cost of a less effective worker. They may get the task done but will take longer. This costs money.

Third, consider the time it takes to get a unit working like a team. The individuals may work well alone but they need to function together and it takes time to do so. This costs money.

The question of how much money it costs for all of these things to occur is hard to tell unless we can look at your financial statements and assess the costs. Often it is cheaper, in real dollars, to keep your people than it is to lay them off.

There are certain instances—such as golf course work or lawn maintenance—where you can keep your key people and lay off your entry level workers.

But in many cases, such as lawn care, you might look at off-season vehicle and building maintenance work or even the marketing function to keep your people employed.

The cost analysis involved in keeping the people should include the costs indicated above plus the benefits of having experienced help.

Experienced help will usually have fewer equipment accidents and may also possess the ability to solve equipment problems easier as they arise in the field.

If you do an exact time and money analysis of management costs, continuity, team building, and efficiency, you might find that the best possible way to work is to retain your people year-round.

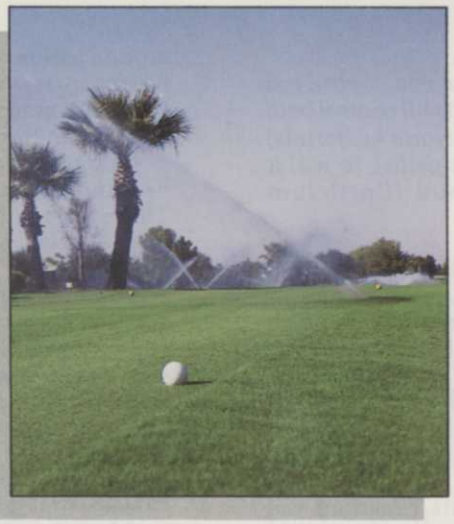
From an organizational standpoint, it is best to keep your people. Often it is cheaper, in real dollars, to keep your people than it is to lay them off.

There is no easy answer to the question of retaining current employees vs. recruiting new hires annually. Each company or organization is different.

Clearly, from an organizational standpoint, it is best to keep your people. Factoring in your costs for retraining and other time consuming management processes will give you the correct picture of actual costs.

Doing both organizational and financial analysis will give you the best possible tool in determining your choice of keeping your people or hiring a new work force for each new season. **WT&T**

Palm Desert Greens Country Club is positive proof.



Maintaining one of the heaviest played executive golf courses in Southern California is a challenging job. An average of 290 rounds of golf a day puts tough demands on the turf, and on the irrigation system. That's why golf course superintendent Robert Stuczynski recently installed Weather-matic rotary pop-up sprinklers to upgrade the system at the Palm Desert Greens Country Club.

Stuczynski was won away from a brand he's used for more than a decade by Weather-matic's high quality design and features. The exclusive adjustable armspring allows fine-tuning while the sprinkler is on or off, and *stays* adjusted once set — a must for handling Palm Desert's exacting schedule of watering or fertilizing.

Weather-matic impact drive, rotary pop-up sprinkler heads are available in rugged cast aluminum alloy and high impact plastic housings for your long-range or medium-range needs — from golf courses, parks and athletic fields to commercial use. Designed for years of dependable service, they offer many outstanding features. Like the backsplash control arm on K-50/80 and PK-50/80. And the optional check valve, available on PK models, to prevent backflow in low areas and damaging line surge. Plus only Weather-matic can help reduce your inventory with interchangeable parts for plastic and metal housings.

When you team up our rotary pop-up sprinklers, controllers and valves, you have a combination that can't be beat. Just ask Stuczynski. He's now finalizing a plan to changeover the entire Palm Desert system to Weather-matic. Because Weather-matic works. Write or call for all the details.

You can't beat the system.

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LAWN AND TURF IRRIGATION

Circle No. 179 on Reader Inquiry Card

PROBLEM SOLVERS

by **Balakrishna Rao**, Ph.D

Red thread control

Problem: *I understand that Bayleton can control red thread disease. Does this mean that it will control both the newly described red thread (Laetisaria fuciformis) and pink patch (Limonomyces roseipellis), or will it control the old name red thread (Corticium fuciforme)? (Maryland)*

Solution: Reports indicate that Bayleton will control the red thread disease caused by *Laetisaria fuciformis* (new name) or *Corticium fuciforme* (old name). It will not control pink patch caused by *Limonomyces roseipellis* (new name).

Therefore, to properly manage these problems, it is important to identify the disease first. The following discussion may help you to distinguish these two newly described diseases.

Recently, turfgrass pathologists renamed red thread disease caused by *Corticium fuciforme* (old name) into pink patch (*Limonomyces roseipellis*) and red thread (*Laetisaria fuciformis*). Both these agents can affect *Lolium* sp. and *Fertuca* sp. but only red thread is reported to affect *Agrostis* sp. and *Poa* sp.

Since pink patch spreads slower than red thread, it will be less severe and won't affect the growth rate of turfgrass. Leaves will be covered with pink, membraneous mycelial growth. Pink patch differs from red thread by the lack of red, thread-like mycelial growth on leaf tips and the pink, cottony flocks of anthroconidia. Pink patch disease can be managed by cultural practices such as proper mowing and feeding programs.

The red thread disease can be prevalent during spring and autumn on slow-growing, nitrogen-deficient turf. The fungal agent kills the affected blades and then pink- or reddish-colored threads protrude from the tip of the leaves. When the disease is active following humid weather, the diseased areas appear reddish-brown. If the disease is severe, provide adequate supplemental nutrients in addition to fungicides to manage the disease.

Desert vegetation

Problem: *Can you provide some information on shrubs, flowers, and greenery that can withstand the heat (110 to 115 degrees Fahrenheit) in the Southwest Low Desert in Phoenix, Arizona? (Arizona)*

Solution: Native Palo Verde trees are well adapted to desert conditions. Although they drop their leaves during drought periods to conserve moisture, their green bark continues the photosynthesis and prepares food. They tolerate intense sunshine and temperature extremes.

There are three species which are adapted and found in the deeper, sandier soils: Mexican Palo Verde (*Parkinsonia aculeata*), Blue Verde (*Cercidium floridum*) and Foothills Palo Verde (*Cercidium Microphyllum*).

Palo Verde trees can be used as shade trees or around patios when they are pruned higher. They do poorly in lawn areas because of too much water. However, among the three species, Blue Verde does better than the other two in a lawn situation.

Other plants which can be grown in your area are deciduous shrubs and broad-leaved evergreens. There are a number of plants which can be selected for a specific purpose such as hedges, shrubs, and groundcovers.

Still another group of plants which are well apapted to desert conditions are cactus, Agave, Yucca and Ocotillo. Contact your local cooperative extension service and request publications on these landscape plants.

Attacking borer problems

Problem: *Do any systemic insecticides go after the borers once they have gotten inside the wood of trees? We have some real problems with shot hole borers in elms, clearwing moths in willows, and flatheads in conifers. (California).*

Solution: Generally, systemic insecticides do not work well for borer problems in plants. Systemic materials move through xylem-conductive tissue and perhaps there is not enough concentration of pesticides near the inner phloem tissues to kill the larvae.

The better approach is to apply pesticides externally on target host plants such as elms, and protect them either from pest infestation or reinfestation. The application should be aimed and timed properly to get rid of the adult population before they have a chance to lay eggs, as well as to get rid of the larvae soon after they hatch and enter into the trunk.

The clearwing moth group includes a number of distinctive pests such as the rhododendron borer, dogwood borer, oak borer, ash borer, willow borer, and poplar borer.

Like other borer problems, managing the clearwing moth on willow (*Aegeria tibialis*) would be difficult by the use of systemic insecticides. Lindane applications on the trunks at monthly intervals from May to August is recommended for general borer problems on willows. This might be useful in dealing with the problems on willows in your area.

We have seen flathead borers on deciduous trees such as apple, but have not seen them on conifers. Contact your local cooperative extension service personnel for more information on all of the above problems and specific pest management guidelines.

Balakrishna Rao is Director of Lawn Care Technical Resources for Davey Tree Expert Co., Kent, OH.

Questions should be mailed to Problem Solver, Weeds Trees & Turf, 7500 Old Oak Boulevard, Cleveland, Ohio 44130. Please allow 2-3 months for an answer to appear in the magazine.

Bombardier MPV-20 has first two-seat design

The Bombardier MPV-20 features the industry's first two-seat design for tractor-type applications. This allows the transportation of an additional worker from one place to another.

The 20-horsepower vehicle is designed to do work like a compact tractor, but with appearance, operator comfort and visibility superior to tractors. It can be used with front or rear

snowblower, mower, or blade. Also, the MPV-20 can be used with rear tiller, front loader, backhoe and agricultural plow.

The MPV-20 is marketed for people with small acreages and for use in municipal, light industrial and institutional work. Distribution throughout the United States is anticipated within 18 months.

Circle No. 190 on Reader Inquiry Card

Heavy duty edgers are for the pros

Pro/Inc. has introduced its Pro 1586 heavy duty edger series for lawn care professionals. Originally designed to meet lawn care requirements in the southestern United States, the new edger series will be marketed in other regions.

The new models include the Pro 1586 edger and the Pro 1586ET. Both models use extra-wide wheels (8¼ x 2

¾ inches) for stability and maneuverability. Also, the front wheel has three positive lock positions to accommodate most curb sizes.

The edger series uses a 3 hp engine with a PTO bearing to handle belt load stress. Other features include replaceable bushings at all pivot points, operator controls on the handlebars, and easy drive belt replacement.

Circle No. 191 on Reader Inquiry Card

Improved Trident R-834 built for efficiency

The 1986 Trident R-834 provides operator comfort and improved vehicle serviceability, according to its manufacturer. The newly designed aluminum cab lowers the vehicle's weight by about 100 pounds, increasing its fuel efficiency.

Another modification in the Trident R-834 is the front end design. Ajustable shocks have improved the turning radius to within 17 feet, allowing easy in-field service to flat tires.

The Trident R-834 still uses the

rugged four-cylinder, 40 hp engine. The vehicle can be fitted with pick-up bed, storage box, dumping refuse or turf beds.

Circle No. 192 on Reader Inquiry Card

Moisture-sensing controller saves on water usage

The Scanex, introduced by Griswold Controls, is one of the most advanced moisture-sensing irrigation controllers on the market. The Scanex eliminates the need to manually calculate evapotranspiration and precipitation

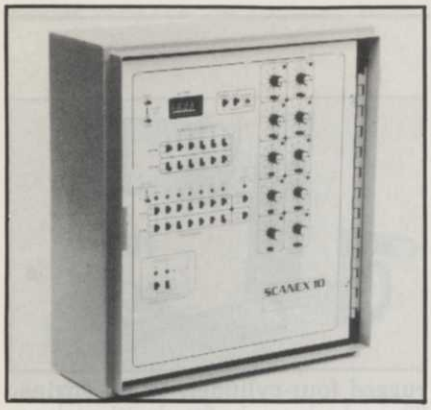
A "Richdel Value" Offer

We invite you to take advantage of our free offer for a Richdel 204/AT one inch valve. This is the fastest selling valve in the industry and features our unique screw-on bonnet. You'll also receive a great introductory offer on our new eight-station self-prompting, self-diagnostic hybrid controller.

Please call 1-800-RICHDEL and ask for Paul LaFleur for your free valve and special controller offer.

RICHDEL
TURF IRRIGATION DIVISION

Circle No. 168 on Reader Inquiry Card



rates, which reduces overwatering problems.

The Scanex also ends accidental irrigation during rain by providing its own moisture control capabilities. Field adjustments are eliminated since all moisture monitoring information and adjustments are done at the controller. It is not necessary to install probes at the valve locations.

The Scanex electronic sensors consist of special stainless steel alloy probes, not tensiometers. The low voltage AC signal ensures a long maintenance-free life.

Circle No. 193 on Reader Inquiry Card

Krum Perlite is now 'dust controlled'

Silbrico Corp. has improved Krum horticultural perlite by providing "dust control" for cleaner handling. Krum controls growing conditions by loosening and aerating soil.

Krum quality begins in manufacturing with sterilization, uniform particle size control and screening. Coarse and medium grades are available. Another improvement is the

new weatherproof plastic bag which allows Krum to be stored inside or out.

Circle No. 194 on Reader Inquiry Card

Middlesworth Engineering introduces rotary mower

Middlesworth Engineering and Manufacturing, Inc. is marketing a new commercial rotary mower with the same features as Middlesworth's larger mowers. Model C4OR has hydrostatic transmissions with variable ground speeds.

The rotary mower has the same heavy construction as larger Middlesworth mowers. It is offset by three inches for trimming and mowing next to buildings. The mower has a six-

Milorganite stands alone

The greatest bargain in fertilizer today!

Value Proven by Analysis and Healthier Turf

Milorganite is loaded with dollar value materials completely lacking in other fertilizers sold for turf and ornamentals.

★ THE MILORGANITE EXTRAS ★

SUPPLIES HUMUS: In addition to being the ideal fertilizer, Milorganite also adds large quantities of organic matter (humus) to the soil. Naturally organic Milorganite actually improves the plant growing capabilities of all soils and has been perceived to reduce disease incidence and the build up of harmful thatch.

NO WATERING-IN REQUIRED: Naturally organic Milorganite does not require watering in, so lawns require less water in the heat of summer. Naturally organic Milorganite improves water holding capabilities of most soils for improved drought resistance.

NATURALLY RICH IN IRON AND CANNOT BURN

NATURAL ORGANIC
Milorganite®
FERTILIZER

America's Number One Organic Fertilizer

60
1926 to 1986
Beautifying America naturally for sixty years

Milwaukee Metropolitan Sewerage District
735 N. Water Street, Milwaukee, WI 53202

Circle No. 143 on Reader Inquiry Card

Frank J. McDonald, Director of Marketing
Cushman Division, Outboard Marine Corporation
Lincoln, Nebraska

CUSHMAN®

"Few things in life last as long and work as hard to make your job more productive and cost efficient."
Frank J. McDonald

An investment in Cushman® turf vehicles and attachments is an investment in a true turf care "working system".

Team up the Cushman Turf-Truckster™ vehicle with one or more of a half-dozen specialized turf care attachments, and you can aerate large or small areas, haul equipment and materials, dump sand, spray, seed or top dress. And, switch from one job to another quickly with the Cushman exclusive "pin-disconnect" system.

The Cushman Turf-Truckster™ vehicle offers plenty of power with the OMC-built 22-hp engine. Choice of 3-wheel or 4-wheel models. And a ground-speed governor control for uniform application over uneven terrain. The Turf-Truckster also rides over fine turf areas without damage to the turf.

No single turf vehicle lets you accomplish so much day after day, year after year.

For more information, and a free full line brochure write:

CUSHMAN
Frank McDonald, Director of Marketing, OMC Lincoln, P.O. Box 82409, 5269 Cushman, Lincoln, NE 68501 or call toll-free: **1-800-228-4444.**

"OUR REPUTATION IS BUILT TO LAST"

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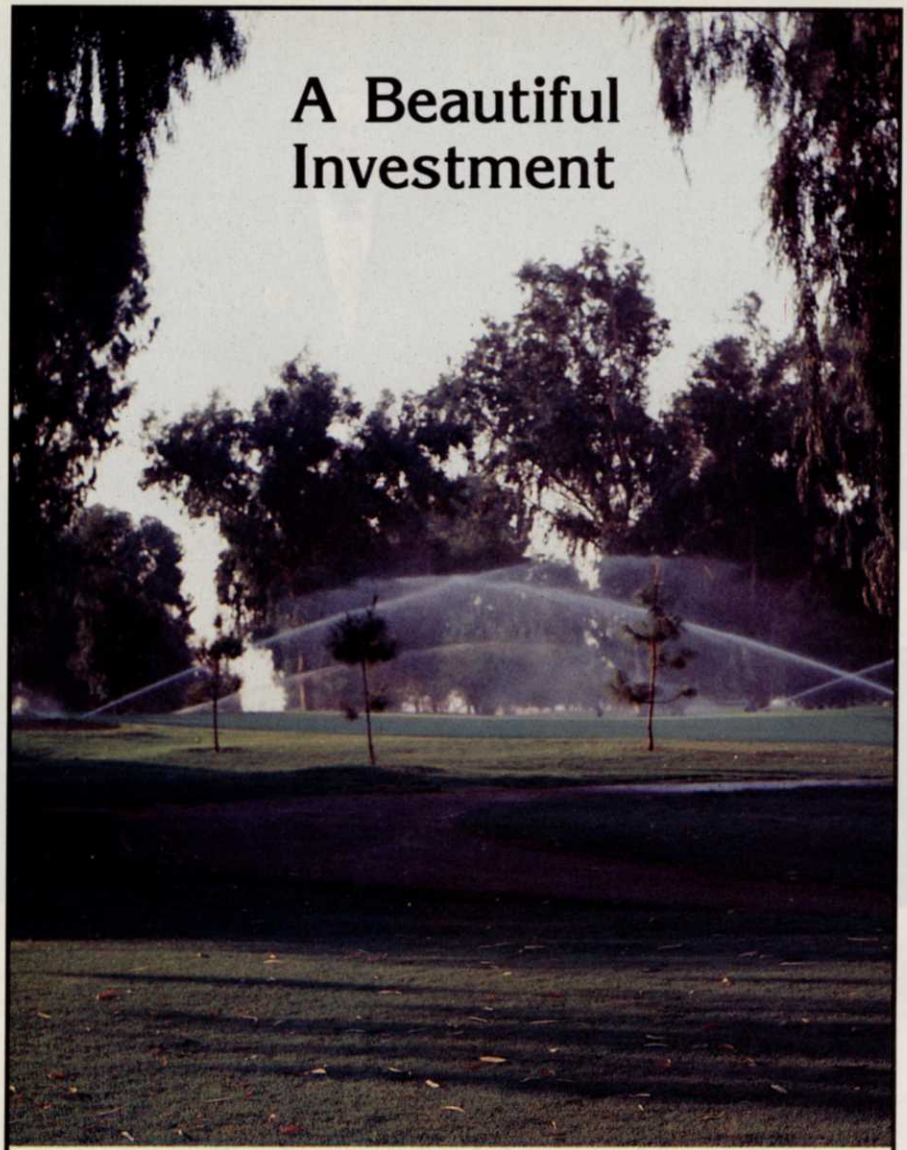

Your investment in long-lasting Buckner brass rotary sprinklers is really an investment in beauty. That's because Buckner products are designed to bring you beautiful greens, tees and fairways effortlessly and with little maintenance.

Our respected line of durable, corrosion-resistant brass rotary sprinklers have the features you want: dual opposed nozzles, extra-heavy retraction spring, above-ground accessibility for easy service, and one piece sand cast brass levers.

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Circle No. 108 on Reader Inquiry Card

inch ground clearance for backing over curbs.

The mower is designed for comfortable operation. Features include a handrail for assisting the operator in getting on and off the machine and a deluxe seat with armrests.

Circle No. 195 on Reader Inquiry Card

Herbicide controls annual grassy weeds

Lesco, Inc. has developed a new herbicide which controls annual grassy and broadleaf weeds in most northern and southern turfgrasses. The new pre-emergence herbicide, Lesco Pre-M 60DG, contains pendimethalin and has been tested at private and university facilities during the past five years.

Lesco Pre-M provides long residual and prevents many annual grassy weeds like crabgrass, goosegrass and broadleaf weeds. Watering isn't necessary for up to seven days following application. Lesco Pre-M is compatible with most fertilizers, insecticides

and herbicides.

The herbicide is packaged in small-acre increment bags for easy shipping, handling and convenient disposal. The formulation eliminates triple-rinsing and does not require heat storage.

Circle No. 196 on Reader Inquiry Card

Deere adds two backpack power blowers

John Deere has added two new power blowers to its line. The blowers include a backpack model, 3E, and an improved power blower, 4E.

Both blowers feature electronic ignition for faster starting. The 3E is powered by a 30.8 cc two-cycle engine, which delivers 2.2 hp at 7500 rpm. It uses a large coupling pipe for maximum air flow. The backrest is rippled for comfort.

The 4E is powered by a 39.7 cc engine which delivers a 3.2 hp at 7500 rpm. The blower has a maximum speed of 135 mph and 280 cubic feet per minute.

One Good Team Deserves Another.

Sprayable

Team™

Tee Time Herbicide II

Spreadable

Team™

Tee Time 25-3-8

Now, The Andersons Tee Time product line is joined by two new Team workers.

Now, The Andersons has incorporated performance-proven Team into two new pre-emergent products designed to knock out grassy weeds before they become problems.

Sprayable Team Herbicide II and **Spreadable** Team with fertilizer . . . Two new results-getting products! Products with the versatility to meet your choice of application methods. Available now at your Tee Time distributor.

The Andersons wants to tell you more about our Team products. Call our Product Information Center at **1-800-225-ANDY** or contact your nearest Tee Time distributor listed below. Now, more than ever, we're:

new **the professional's partner™**

The Andersons

Call toll-free 1-800-225-ANDY

TEAM® Registered Trademark of Elanco Products Co.

Your closest Tee Time Distributor is listed here:

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(402) 331-0200 / (800) 228-9761

BIG BEAR TURF EQUIPMENT CO.
Eldridge, IA
(319) 285-4440

BUNTON SEED COMPANY
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WILSON FEED AND SEED
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Circle No. 104 on Reader Inquiry Card

A mist attachment is available for both models. The attachment allows

liquid chemicals to be applied in mist form.

Circle No. 197 on Reader Inquiry Card.

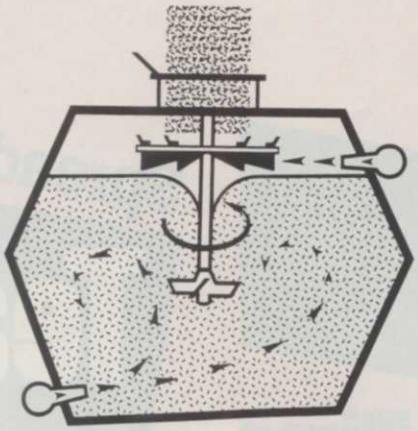
Hydrograssers reduce loading time, clogs

Reinco Inc.'s new "G" Series Hydrograssers features pump and power-train changes, tank modifications, and a water-powered hydraulic mulch grinder which aids mixing during loading, according to the manufacturer.

Reinco says by using the grinder, tightly-packed mulches can be assimilated in as little as 10 seconds per bale. Loading time can be reduced by 1000 percent or more.

The grinder's chopping motion reduces the chance of clogs since many are caused by mulch clumps which haven't been broken apart.

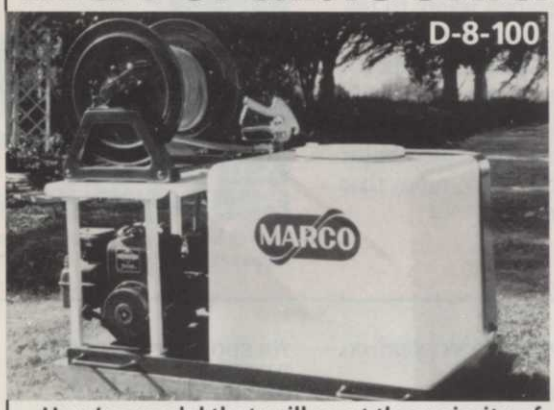
The "G" Series Hydrograssers are available in 1000-, 1500-, and 3000-gallon sizes.



Reinco dual grinder/mixer feature with water jet drive.

Circle No. 198 on Reader Inquiry Card.

MARCO: A Lot of Sprayer in a Portable Unit!



Make applications of herbicides, pesticides and fertilizer quick and easy with a MARCO sprayer! MARCO's Prime Line of more than 20 models of spraying equipment features one-piece, hand-laid and baffled fiberglass tanks in custom sizes – each with a 20-year warranty!

Call or write for a brochure illustrating our complete line. We can custom build to fit your needs, too.

Contact MARCO today – and put our fully professional, fully affordable sprayers to work for you!

Here's a model that will meet the majority of your requirements:

Model D-8-100

Specifications	
Pump Cap.	14 GPM
Pressure	550 psi
Power	8HP Briggs & Stratton Engine
Tank Cap.	100 up to 400 gallons
Standard Agitation	Jet
Pressure Control Unit	15 GPM
Standard Drive	Direct

Options

- Turf Trailer Mounting
- Belt-Driven Mechanical Agitation
- Fill Well Basket Filter
- Canopy and Hose Reel to Hold 200′ of ½″ hose
- Dry Booms in Varying Lengths
- Boom Jet – Pistol Grip Gun
- 52″ or 72″ Hand Boom and Drift Skirt

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KEES™

Better Lawn Care Products for Particular People

(THATCHER)
Fold-over handle

Model 101584

POWERAKE®

- Rakes out thatch
- Cleans 20″ swath
- Powerful 5 hp engine with dual filter air cleaner
- 28 hardened steel plate, self-cleaning fingers
- Heavy duty steel wheels with grease fittings and sealed ball bearings
- Raking assemblies interchangeable with aerator assembly
- 2″ single-action raking height adjustment
- Semi self-propelled

21″ Commercial MOWER (Rear or Side Discharge)

Model 2114C0

This powerful 21″ mower with heavy gauge cast aluminum/magnesium deck is built to stand up under tough use and keep on working year after year.

- Powered by a 4 cycle, 4 h.p. Briggs & Stratton engine with flywheel brake.
- Heavy gauge steel handle.
- Special one-piece Ultra High lift blade with tempered cutting edges. Adjustable cutting heights from 1½ to 4 inches.
- Equipped with regreasable double ball bearing wheels. 8 x 1.75 tires on front, 10 x 1.75 on rear.
- Your choice of self-propelled or push type.
- Dual filter air cleaner.
- Extra-large 3 bushel nylon bag grass catcher available.

Since 1874

Write P.O. Box 1135

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Beatrice, Nebraska 68310

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IT'S SAFE ON THE BROADEST RANGE OF TURF AND ORNAMENTALS.

You have to be careful when you put down most preemergence herbicides. They're safe on turf *or* ornamentals. Not on both.

Enter CHIPCO® RONSTAR® preemergence herbicide. The only product you can use safely to weed the whole landscape: turf, woody ornamentals, ground cover, and trees.

RONSTAR herbicide solves a lot of problems. And simplifies your inventory and application. It causes no root pruning. Needs no incorporation. Won't leach or move into untreated areas.

RONSTAR GIVES EXCELLENT WEED CONTROL.

Just one application of RONSTAR herbicide gives effective, season-long control of over twenty of your toughest annual broadleaf and grassy weeds.

FOR A GOOD-LOOKING LANDSCAPE, TAKE A GOOD LOOK AT RONSTAR HERBICIDE.

If you'd like to find a simpler, safer way to keep weeds under control, find out more about the preemergence herbicide that covers the landscape: CHIPCO RONSTAR herbicide.

See your dealer, or write: Rhône-Poulenc Inc., Agrochemical Division, Monmouth Junction, NJ 08852.

RHÔNE-POULENC

RONSTAR®

SPREAD THE WORD.

Please read the label carefully, and use only as directed.

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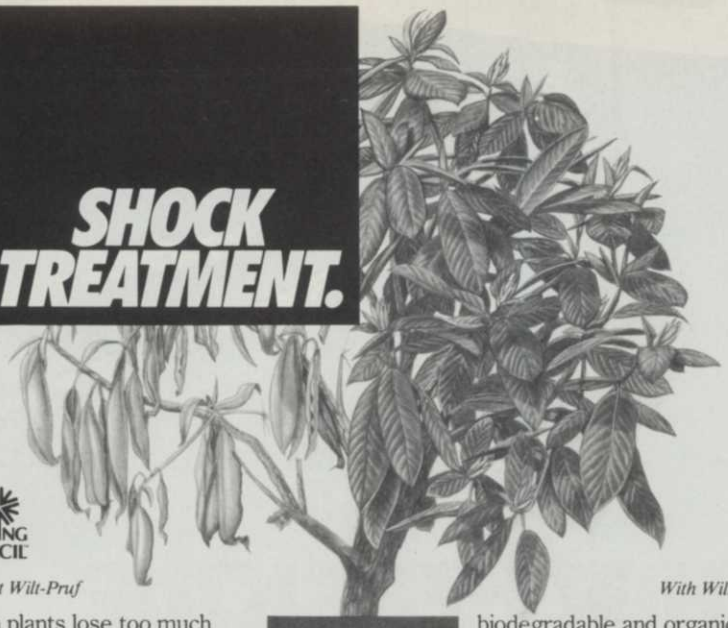
SHOCK TREATMENT.



We support THE PLANTING COUNCIL

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When plants lose too much moisture during a move, the result can be wilting, shock — even death.

Wilt-Pruf® helps prevent transplant shock by providing a protective coating that holds in essential moisture.

With Wilt-Pruf, you'll have less transplant failures and, as a bonus, more satisfied customers. Another plus, it's biodegradable and organic.

Wilt-Pruf is the ideal way to give your shrubs the edge when transplanting. Don't make a move without it.

WILT PRUF®
ANTI-TRANSPIRANT

Guards against moisture loss year 'round.

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Circle No. 181 on Reader Inquiry Card

EVENTS

MARCH

Massachusetts Turf Conference, March 3-6, Springfield Civic Center, Springfield, MA. Contact Dr. Joseph Troll, Dept. of Plant & Soil Sciences, Stockbridge Hall, U. of Mass., Amherst, MA 01003. (413) 545-2353.

Horticultural Therapy Symposium, March 14, Pittsburgh Civic Garden Center, Pittsburgh, PA. Contact Cindee Howard, New York Botanical Garden, Bronx, NY 10458. (212) 220-8743.

Horticultural Therapy Symposium, March 15, North Carolina Botanical Garden, Chapel Hill, NC. Contact Cindee Howard, New York Botanical Garden, Bronx, NY 10458. (212) 220-8743.

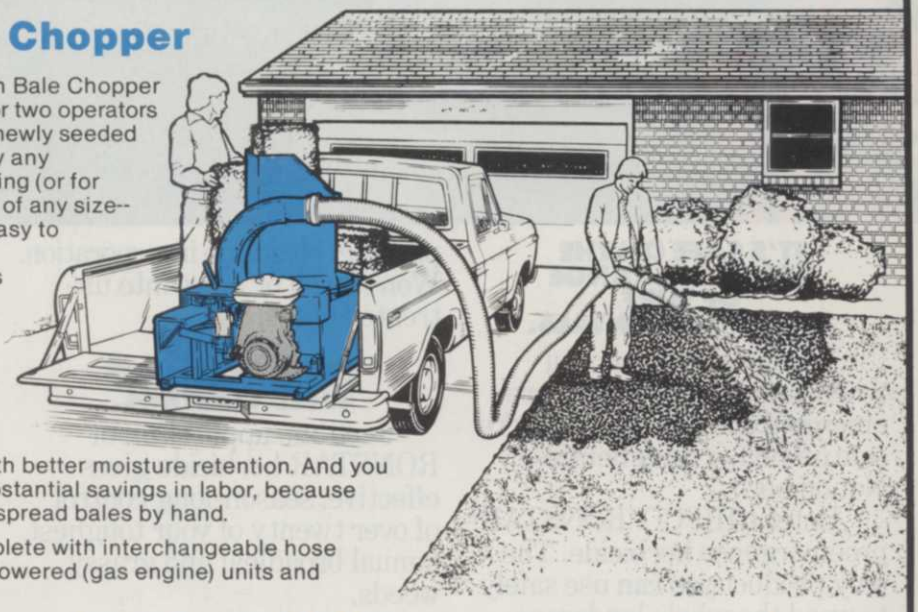
International Atlantic City Flower Show, March 22-30, Atlantic City, NJ. Contact International Atlantic City Flower Show, 132 Avon Place, Amityville, NY 11701. (516) 598-3355.

To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 7500 Old Oak Boulevard, Cleveland, OH 44130.

THE MULCHING SOLUTION

The Goossen Bale Chopper

In the field since 1982, the Goossen Bale Chopper is a proven machine which lets one or two operators lay down an even layer of mulch on newly seeded lawns. It chops and spreads virtually any material that can be used for mulching (or for composting!). And the lawns can be of any size--the Bale Chopper is compact and easy to maneuver in even the smallest residential applications. That makes it a very efficient and practical machine for landscaping.



The ***Landscapers' answer*** to the problem of clumps and gaps in mulching coverage, the Bale Chopper gives you even-blanket coverage for better germination, with better moisture retention. And you get this excellent coverage at a substantial savings in labor, because you eliminate the need to tear and spread bales by hand.

The Bale Chopper is available complete with interchangeable hose and directional spout, in both self-powered (gas engine) units and tractor-hitch PTO models.

Call right now and let us show you how the Goossen Bale Chopper can save you time and money!

Toll Free 800-228-6542
In Nebraska, (402) 228-4226

Goossen INDUSTRIES
927 West Court St. ● P.O. Box 705 ● Beatrice, Nebraska 68310

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Tough mowers... from rough cut to smooth finish.

The CM Series

Extra Heavy Duty Hydrostatic Rotary Mowers for Commercial/Municipal Users

Superior performance in both rough cut and refined mowing at speeds to 11 miles per hour. The "CM" gives the commercial user a tough, low maintenance machine that mows better at top speed than other mowers at half the speed. And does it with the added safety of rear discharge.

Kut-Kwick. More than forty years of experience building professional mowers for professional users.

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Telephone 912-265-1630

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In GA. 1-800-592-5945

Circle No. 233 on Reader Inquiry Card

CLASSIFIEDS

RATES: $1.00 per word (minimum charge, $25). Bold face words or words in all capital letters charged at $1.25 per word. Boxed or display ads: $85 per column inch-1x (one inch minimum); $80-3x; $75-6x; $70-12x. Agency commissions will be given only when camera-ready art is provided by agency. For ads using blind box number, add $5 to total cost of ad. Send ad copy with payment to Dawn Nilsen, WEEDS TREES & TURF, 1 East First Street, Duluth, MN 55802 or call 218-723-9200.

BOX NUMBER REPLIES: Mail box number replies to: WEEDS TREES & TURF, Classified Ad Department, 120 W. 2nd St., Duluth, MN 55802. Please include box number in address.

BUSINESS OPPORTUNITIES

WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15485 N. East Street, Lansing, Michigan 48906. Phone (517) 484-7726. TF

Franchise Opportunity; Industrial Vegetation Control—Box 3187, Enid, OK 73702. Small Investment-Large Return. Kem Weed Trademark. 8/86

Wanted: Landscape maintenance, tree maintenance, chemical lawn care accounts, equipment, etc. Boston, MA & surrounding areas. Reply to: Landscape Maint., 7 Chute Street, Reading, MA 01867 5/86

Profitable Zoysia Farm - centrally located, PA, NJ, DE. 1986 crop tray-ready. 7¼ acres, historic homestead, outbuildings, equipment, irrigation pond and well systems. Forced to sell. Owner illness. Hoopes-Alloway Realtors, Vincentown, NJ (609) 849-2200. 3/86

POSITION WANTED

Golf Pro-Supt.: Father and son golf management team, with 27 hole golf course past 18 yrs. both PGA members and greens supts. Willing to relocate, excellent references. Write WTT Box 385. 3/86

FOR SALE

Ryan Ride-Aire Areator, Good condition, top quality coring, $2,200, 201-341-6163. 4/86

FOR SALE—1983 Harley Rock Picker, 12′ Rock Windrower in Phoenix, Arizona—best offer, both units used on only one project. Gundersons, Inc., Rapid City, SD 605-342-1078. Ask for Mr. Gunderson. 4/86

POPLAR SHADE TREES: Long life-rapid growth-full rounded shape. The perfect shade or screen tree. For prices and brochure call or write: Farley's Nursery, 6200 Gay Road, Orient, Ohio 43146. 614-877-4572. 3/86

4500 MF forklift, diesel, side shift, excellent condition, low hours - $12,500. 2500 MF forklift, diesel, side shift, new motor, rebuilt transmission, - $10,000. Meyers Turf Farm, Box 69, Stilwell, KS 66085. (913) 681-2668. 4/86

LIGHTED PAR 3 GOLF COURSE - 15 ACTIVITY RECREATION FACILITY AND 3 COMMERCIAL BLDGS. Central Indiana, Box 205, Mt. Summit, IN 47361. 317-284-1459. 317-836-4992. 3/86

Landscape Design RUBBER STAMPS
FREE BROCHURE
Landscape Design Kits
Interior Plant Sets
Tree Stamps Books
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LAWN SEED. Wholesale. Full line of top quality grasses. Imported bluegrass varieties, fine fescues and fine bladed ryegrasses. We specialize in custom mixing. Oliger Seed Company, 2705 Wingate Avenue, Akron, OH 44314. Call collect (216) 753-2259. TF

TREE FERTILIZATION GUN, tested on over a million square feet of trees and shrubs all over the U.S. Good to 500 psi, repairable, non-corrosive. Buy direct from manufacturer, $106.00. (shipping included). Arbor-Nomics, Inc., 5634-A Buford Highway, Atlanta, Georgia 30071. (404) 447-6037. TF

BUCKET TRUCKS, straight stick, corner mount and knuckle boom cranes. Sprayers, chippers, dumps, stakes, log loaders, crew cab chip box dumps, railroad trucks. 50 in stock. Sold as is or reconditioned. Opdyke's, Hatfield (Philadelphia area). 215-721-4444. TF

HI-RANGERS AERIAL BASKETS 65', 57', and 53'. Skyworkers aerial baskets 65', 50', 40'. Vermeer stump cutter 1560,6. Vermeer tree spade 66, TS 44. Asplundh bucket and brush chippers, Bean sprayer, 9 ton trailer. Parkway Tree Service, 12026 W. Cherry, Wauwatosa, Wisc. 53226. (414) 257-1555. TF

HYDRO-MULCHERS AND STRAW BLOWERS New and used. **JAMES LINCOLN CORPORATION,** 3220 S. Jupiter Rd., Garland, TX 75041. (214) 840-2440(TX), (800) 527-2304 (except TX). TF

BALL BARRIER NETTING: Made of olefin fibers. 6 ½ feet and 25 feet high. Strong and tough. Will not rust. Easy to handle. For Driving Ranges and Golf Courses. Keep golf balls from straying off-course. J.A. Cissel Mfg. Co., P.O. Box 339, Farmingdale, NJ 07727. 1-800-631-2234. TF

BROUWER HARVESTER OWNERS! ELECTRIC DEPTH CONTROL. Save time and money with improved quality control. Make depth-of-cut adjustments, on the move, with one button finger tip control. Allows you to cut longer rows through varying soil conditions. $795.00. 30-day satisfaction guarantee and full-year warranty. Write or call: Shattuck Turf Equipment, 1872 N.W. 82nd, Des Moines, IA 50322, (515)278-5255. Patent pending. 3/86

SPRAY TRUCKS—4 units 1977 Chev. C50 with 800 gal. tanks, hydraulic pump, reel and agitation system, ready to spray. $5,000 each. 1 unit 1977 Ford F-750 with 1,500 gal. tank. Bean 20-20 pump, 2 Hannay electric reels, ready to spray, $10,000. Call 401-737-4611. 3/86

Princeton Self-Propelled Sod Cutter. Excellent condition. $12,000 or best offer. 801-756-9900 or 801-756-5788. 3/86

1500 gallon Finn Hydro-seeder mounted on 1975 LN700 Ford truck with new 10 foot Western snowplow. Hydro-seeder model HSUSX16A, completely restored, custom mounted polyurethane paint pump rebuilt, Ford industrial diesel engine, completely rebuilt, excellent working order, clean. Truck good rubber, 70,000 miles on engine, excellent working order, clean, Complete - $21,500. Tom Allen, Allen Landscape Construction, Highland, IN 46322. (219)924-3938. 3/86

BROWER—7 Gang PTO mower and new parts. Low use, good condition. $5,500. FOLEY—388 reel sharpener, like new, $1,500. (405)771-5122. P.O. Box 424, Spencer, OK 73084. 3/86

SPRAY TRUCKS 1980 GMC: Series 6000 350 V8 4 speed and 2 speed axle. Units are equipped with 1200 gal. Tuflex fiber glass tanks, mechanical agitation, 10 GPM Bean pump, 50 gal. side tank, 8 hp. Kohlar engine drive, Haney electric hose reel and detachable 1200 lb. capacity granular fertilizer box. $10,500.00. Call: Bob MacPherson, 1-312-293-1036. 3/86

SPECIAL NOTICE—~~Howard~~ Gems 20″, 24″ 30″ are in production again—equipped with Kohler, Wisconsin or diesel. Other rear tine tillers, 8″ to 40″, 5.7 hp to 24 hp, gas or diesel— from $995. Tractor Tillers and Turf Quakers, 30″ to 180″— from $995. Engines, pumps, generators, accessories . . . . "Let Us Bid Your Equipment And Service Needs!" G. Gandy Equipment Services, 2031 4th Avenue, Joliet, IL 60433. 815-726-7921. 4/86

NEW YORK CITY AREA - LANDSCAPE MAINTENANCE, CONSTRUCTION & IRRIGATION COMPANY FOR SALE: Gross - $800,000. Many commercial accounts included. $150,000 worth of equipment. Asking price - $950,000. Write WTT Box 383. 3/86

Hybrid Poplar Trees - Rapid growth - up to 10 feet first year! Excellent as landscaping, screen, shade, or specimen tree. Ideal border plantings. Inquiries promptly answered. Free catalog. Insti-Trees Nursery, Box 1370-Dept. WT, Rhinelander, WI 54501. 715-282-5247. 3/86

280 Acre Sod Farm. San Augustine, Raleigh, Bermuda and Centipede. 50 miles East of Houston. Also serves markets San Antonio, Austin, Dallas-FW, Louisiana. Abundant water, ideal soil. Equipment-late models. 20 acres co-planted with live oaks, shade trees. 713-450-1766. Leave message. 4/86

Jacobsen F133 Mower $1,500.00; Jacobsen Turf Sweeper (P.T.O) $850.00; 3 Cushman 100 gal. John Beam with boom $2,000.00; All excellent - (516) 234-5426. 3/86

Spyder Forklift Parts—Mobile Lift Parts has replacement parts for your Spyder. Torque hubs also available. Call or write: Mobile Lift Parts, 5402 Edgewood Rd., Crystal Lake, IL. 60014. 815-455-7363. 3/86

FOR SALE—Spray truck 1980 1200 Gallon Lawn spray tank, PTO driven Bean Pump with 2 hose reels and mechanical agitation on 1976 Ford F600. Good condition - $6500. Pittsburgh, PA 412-366-2452. 3/86

BOWIE HYDRO-SEEDER, 920 Gal. Tank, Tandem Trailer, Bought '82. Good shape. 912-228-9494 or P.O. Box 123, Thomasville, GA 31790, $7500. 3/86

NEW, USED AND RECONDITIONED SPYDER FORKLIFTS. ALL IN GOOD CONDITION. THOMAS BROS., GRASS, ARLINGTON, TX 817-261-7346. 3/86

SOD FARM—18 acre producing farm complete with equipment, beautiful country home and barn. Established 1972 and has produced the area's finest sod. 20 minutes from downtown Indianapolis. Call 317-769-3230. 3/86

1 - 1975 Brower sod harvester, 18 inch rolling on Ford 3000 diff. lock, excellent condition. (414)466-8950 or (414)895-2695. 3/86

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If you haven't checked out the Professional Grounds Management Society recently, then you're in for a surprise. We're offering a bundle of new benefits that make joining PGMS more rewarding than ever! Here's what we've been up to and how you can benefit:

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For Sale

BOWIE HYDRO-MULCHERS AND STRAW BLOWERS. New and used. Landscape Supply, Ltd., P.O. Box 22092, Greensboro, NC 27420. (919) 292-2922. 5/86

NEW and USED EQUIPMENT— Asplundh, Hi Ranger and Lift-all forestry bucket trucks, Chipmore wood chippers. Mirk, Inc., (216) 669-3567. (216) 669-3562, 7629 Chippewa Road, Orrville, Ohio 44667. TF

1979 TORO HTM 175. 7 gang hydraulic fairway mower, diesel. Only 3 northern seasons. 1,200 hours, reels ground, sharp, ready to go. $22,000 or offer. (313)855-0700. 3/86

For Sale: 900 acres sod, mint and vegetable farm, will split $900 per A. 7 gang Roseman sharpened, $1350. Ryan Sod cutter with Ryder, $1350. 414-326-5267. 3/86

FOR SALE: 1980 7700 FORD TRACTOR WITH 83 MOTT 88" REVERSE FINE CUT FLAIL MOWER, 63 HOBBS 40 FT. PLATFORM TRAILER. CALL 817/365-9904 OR 214/248-0557 RT. 1, BOX 15, AUBREY, TEXAS 76227. 3/86

MYERS HIGH PRESSURE TREE SPRAYER- 500 gallon tank and 55g. p.m. pump mounted on a 1972 Chev. 40 series trunk. Electric hose reels. Truck and sprayer well maintained and in excellent condition. Call 717-898-8591 after 4 P.M. 3/86

HELP WANTED

HELP WANTED
TURF SPECIALIST

Position for trained, educated and experienced Turf Specialist at a rapidly expanding 150 acre corporate Sculpture Garden and Arboretum. The general scope of the work will include the care of bluegrass and mixed turf areas: diagnosis, chemical application, mowing, aeration, renovation and the training and supervision of the staff. Snow removal and woodland work during off season. Excellent benefits. Send resume and salary history.

CARMINE LABRIOLA, INC.
Providing Horticultural Services to Corporate Landscapes

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3/86

LAWN MEDIC. SERVICE TECHNICIAN: Full time positions, year round employment. Lawn care experience preferred. Competitive salary and fringe benefits. Call 1-3 p.m. (919) 724-7075 or NC only 1-800-822-3224, or send resume: P.O. Box 769, Kernersville, NC 27285. 3/86

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Office Management Personnel needed.
Residential Work Only,
Send Resume to:

Dennis Anderson & Wife, Inc.
P.O. Box 702
Barrington, IL 60010 4/86

HELP WANTED—Fine Grade Box Operator—Expanding landscape firm in Northern Virginia area seeks knowledgeable individuals for permanent position. Salary commensurate with experience; many benefits plus bonus opportunities. Send resume with complete background experience to: S. Burton & Co., Inc., P.O. Box 147, Hartwood, Virginia 22471. 3/86

Tree and shrub specialist Chemlawn Services Corporation/ Are you an ambitious person who is willing to take risks in a company growing at a 25% yearly rate, a company who has promoted 150 managers last year, a company which is the recognized leader in its industry? If so, you may qualify for an opportunity to join the Schaumburg, Illinois branch. Responsibilities will include sales and servicing our customers. This outstanding ground floor opportunity offers a salary, fringe benefits, continual job training and unlimited challenge. To find out more about this career opportunity, please write or call **Chemlawn Services Corporation, 1103 W. Morse Ave., Schaumburg, IL 60193, 312-529-4200.** 3/86

LANDSCAPE MAINTENANCE & INSTALLATION: Now interviewing for positions of foreman and assistant foreman for installation and maintenance crews. Prior experience and good references a must! Pay commensurate with experience. Get in on the ground floor of a fast growing, quality-oriented company. Send resume to: Creative Scapes, Inc., c/o Rick, 1401 West Paces Ferry Road, Suite B-110, Atlanta, GA 30327. 3/86

LANDSCAPE MAINTENANCE WORKING FOREMAN—Permanent year-round position available for person with turf management background. Knowledge of pesticides and fertilization necessary as well as supervisory skills. Excellent salary and benefits. Send resume describing pertinent experience and salary requirements to: Dodds & Eder, 39 W. Main Street, Oyster Bay, NY 11771. 3/86

LANDSCAPE MAINTENANCE AND CONSTRUCTION FOREMEN: Suburban Cleveland firm is seeking experienced individuals who can work together with other people. Must be hard working, organized and capable of directing a project from beginning to end. You will report directly to the President. Salary commensurate with experience. Send resume to: P.O. Box 391002, Solon, OH 44139. 6/86

ASSISTANT GOLF COURSE SUPERINTENDENT: Metro New York area. Good salary and benefits. Plenty of room for advancement for the right person! Please send resumes to: Northeastern Corporate Landscape Services, Inc., P.O. Box 28, Armonk, NY 10504 or contact Mark Sosnowitz, 203-324-4941. 3/86

Landscape Construction Manager - Established maintenance company seeking individual with broad experience to develop a design/build division to compliment existing operations. This individual should have a solid sales, estimating, design and construction background, and a stable, verifiable work history. Send resume and requirements to Landscape Care Co., 4026 Pacheco Blvd., Martinez, CA 94553. 3/86

Supervisors (project foremen) join a nationally acclaimed firm looking to expand into its second generation Long Island area supports a high budget landscape industry. Year round employment, company benefits and continuing education available. Experienced and aggressive people send resume to: **GOLDBERG & RODLER, INC.,** 216 East Main Street, Huntington, New York 11743. 3/86

LANDSCAPE TURF & ORNAMENTAL SPECIALIST—Great opportunity with rapidly expanding firm on Long Island, New York. Must have landscape experience and technical knowledge in order to qualify. (Formal education a plus.) New York state pesticide applicators license necessary within one season. Send resume describing pertinent experience and salary requirements to: Dodds & Eder, 39 W. Main Street, Oyster Bay, NY 11771. 3/86

LANDSCAPE IRRIGATION SPECIALIST: looking for qualified individuals in total irrigation repair and installation. Salary commensurate with experience. Much room for expansion! Send resume to: Sprinklescape, Inc., P.O. Box 175, Glenville Station, Greenwich, CT 06830 or contact Mark Sosnowitz, 203-324-4941. 3/86

Tree and Shrub Care. America's fastest growing tree and shrub company seeking experienced, aggressive Horticulturist's for existing and expansion markets. Experience, degree and motivation key ingredients. Tremendous advance opportunities. Excellent salary, benefits. All inquiries will be strictly confidential. Send resume, salary history to: William Scott Carr, Tru Green Tree and Shrub Care, 8324 Shaver Road, Kalamazoo, MI 49002. Expand your potential with an industry leader. 4/86

Management Trainee - ServiceMaster LawnCare - We are a multinational service company looking for people to train for management positions in our rapidly expanding franchise operation. We need people with good communication skills, customer service orientation, and willingness to relocate. We offer compensation based on ability and productivity, complete benefit package, and the opportunity to grow with the number one service company of the Fortune 500. Please respond with resume, salary history and requirements to: ServiceMaster Industries, LawnCare Division, 2300 Warrenville Road, Downers Grove, IL 60515. T/F

HELP WANTED - A diversified growing landscape company in the Northeast is looking for experienced people for Landscape Design, Construction and Maintenance as Supervisors and Managers. Salary to be determined by experience. Send Resume including work and salary history to: Control Env. Services, Inc., 333 Meadowland Pky., Secaucus, NJ 07094, attn: J.R.B 4/86

INDUSTRIAL HERBICIDE APPLICATOR - Job openings for quality herbicide applicators (Southeast, Northeast). Must be motivated and be willing to travel. Mechanical ability desirable. Send resume or call Weeds, Inc., 520 W. Cobbs Creek Parkway, Yeadon PA 19050, (215) 727-5539. 4/86

Olathe MODEL 12 P.T.O. CHIPPER

PORTABLE
DEPENDABLE
ECONOMICAL

- Less than ½ the price of equal capacity chippers
- Fits most tractors from 25 to 100 H.P.
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Popular 3-pt Hitch Model or Pull Type Trailer Option

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Circle No. 185 on Reader Inquiry Card

REPS WANTED

LANDSCAPE MAINTENANCE SALES—Positions available in sales with one of Dallas/Fort Worth's leading landscape maintenance companies. Respondents must have experience in landscape maintenance or related field and comprehensive sales background. We're looking for personable, ambitious and self-motivated people. Please send resume with salary requirements in care of WTT Box 350. 3/86

SALES REPRESENTATIVES

Leading pesticide manufacturer is currently seeking a seasoned sales professional for the turf and ornamental market in the Pennsylvania and Ohio area. Qualified candidate must have a minimum of 5 years working in turf and ornamentals.

Please forward resume and salary requirements to WTT Box 384.

Equal Opportunity Employer.

SALES REPRESENTATIVE for established full service tree company in Pittsburgh, PA. Must have a degree in Horticulture or related field, thorough knowledge of equipment, chemicals, tree identification, insect and disease problems and at least two years experience as a climbing crew leader. Must work well with people, good manners, good communication skills. Year round work. Must be willing to work long hours during peak season. Salary: $25,000.00 per year. Benefits: Company car, health insurance, sales bonus, profit sharing plan. Only qualified apply. Please send resumes to: P.O. Box 11533, Pittsburgh, PA 15238. 3/86

LANDSCAPE MAINTENANCE FIELD SUPERVISOR—Great opportunity available with large, quickly expanding firm in Dallas area. Must have landscape experience and technical knowledge in order to qualify. Excellent salary plus benefits and bonus incentive programs. Send resume describing pertinent experience and salary requirements in care of WTT Box 353. 3/86

BUSINESS MANAGER for large New York Metro landscape company. Experience necessary. Good salary and benefit package. Profit sharing possibilities. Write to: Sprinklescape, Inc., P.O. Box 175, Glenville Station, Greenwich, CT 06830 or call Mark Sosnowitz, 203-324-4941. 3/86

GREENS-TURF MANAGER Ohio Golf Course seeking an experienced, motivated, personable self starter, with a thorough knowledge of turf grass maintenance, fertilization, pest control and mechanically inclined. Excellent compensation package offered. Send resume to WTT Box 382. 3/86

LANDSCAPE MAINTENANCE AND CONSTRUCTION SUPERVISORS: Rochester, N.Y. Responsibilities include production and sales - Commercial/Residential. Excellent career opportunities for responsible, ambitious, and self motivated individual. Send qualifications and employment history to: P.O. Box 92, Webster, NY 14580. 3/86

SOD FARM MANAGER: 500 acre Chicago-area operation seeks qualified manager. Involves production, irrigation, and harvesting. Excellent salary and benefits. Send resume to WTT Box 354. 3/86

SPRINKLER SYSTEM INSTALLER - Established Colorado landscaping firm needs individual with 3-5 years experience in design, layout and installation. Good salary and benefits. Write WTT Box 381. 3/86

LANDSCAPE FOREMAN for expanding design-build firm. Design education, field experience, and ability to work with men a must. Send salary requirements and detailed record of former employment and education to: Soergel Assoc., Babcock Blvd., Gibsonia, Pa. 15044. (412-443-1051). 3/86

USED EQUIPMENT

TURF EQUIPMENT: 1 Howard HP-180, 3 Howard 727's, 3 Toro 72's, 1 Jacobson 5-gang frame and 6 reels, Thatchers, Edgers, Weedeaters, Reel Mowers and much more. Irvine, CA (714) 857-6408. 5/86

FOR SALE: MIGHTY - SPIKE AERATOR, WITH DOUBLE BIN SEEDER-$1400 - GOOD CONDITION. **WANTED TO BUY:** RYAN SPIKEAIRE - ANY CONDITION - (201) 664-1665. 3/86

TREE TRIMMING EQUIPMENT—Aerial basket trucks with chip boxes and chippers (1970-1975). Priced to sell—offers accepted. Call (218) 724-7622, or write ATS, P.O. Box 3280, Duluth, MN 55803. TF

WANTED TO BUY

SELLING A GOLF COURSE? Qualified Buyer Seeking To Acquire Top Sunbelt Course. Call Rob Landham, (615)842-4646. 3/86

Wanted—Brouwer Harvester 18", forklift (spyder type), tandem axle truck and trailer. Send photo and description. Schulz Sod Farms, 1833-33 St., N.W., Rochester, MN 55901. 4/86

WANTED-SPYDER, HITCHHICKER OR EQUIVALENT FORKLIFT. 216-494-2404-AFTER 6:00 P.M. 3/86

WANTED: Large Lindig and Royer Shredders. Lewis Equipment, 320 Third Street S.W., Winter Haven, FL 33880. (813)294-5893.

Wanted to buy **HYDRO SEEDER**. Please send photo. Johnson Hydro Seeding Corp., 13751 Travilah Road, Rockville, MD 20850, 301/340-0805. TF

MISCELLANEOUS

REPLACEMENT PARTS SPECIALISTS, INC., 377A Yellowbrook Road, Freehold, New Jersey 07728. Top quality parts to fit Bobcat, Bunton, X-Mark, John-Deere, Kee's, Gravely, Pro-40 and Pro-36 commercial mowers. 20 years landscaping experience gives us the know-how to build parts that last. Gear box kit/wheel belts/spindle assemblies/wheels/caster supports and 105 other parts. **"WE WILL NOT BE UNDERSOLD BY ANYONE."** 201-938-5683. Canada to Virginia 1-800-526-2757.

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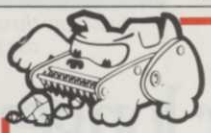
Olathe
TURF & TREE

OLATHE MANUFACTURING, INC.
100 INDUS. PKWY., INDUS. AIRPORT, KS. 66031
913-782-4396
800-255-6438



ROCKHOUND TEACHES THE ABC'S OF GROUND PREPARATION

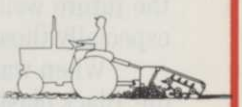
A SERIES ROCKHOUND

Dumping

Skid Steer Mount (Hydraulic)

3 Point Mount

B SERIES ROCKHOUND



Open bottom—PTO Drive. Rocks are raked to a convenient windrow for later pickup.

COST EFFECTIVE ROCKHOUNDS Rake and collect rocks and surface debris, leaving the soil in a fluffy, level, seed-bed quality condition.

It does not cost to own a ***Rockhound . . . IT PAYS!***

1-800-426-5615
KEM ENTERPRISES, INC. 2309-A So. Tacoma Way, Tacoma, WA 98409

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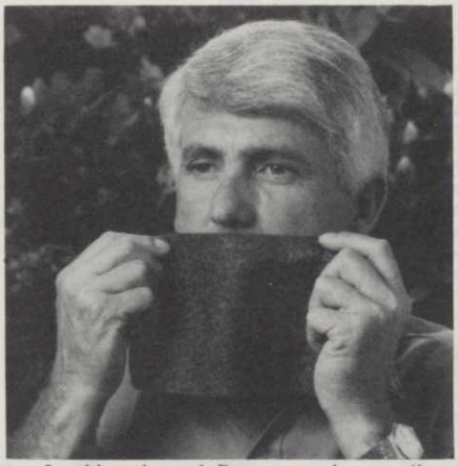
THIS TEST WON'T HOLD WATER —OR AIR.

Water passes easily through highly permeable Duon Weed Control Mat.



Just blow through Duon to see how easily air passes through it.

The proof is stronger, longer lasting plants with DUON® Weed Control Mat.

Both water and air pass easily through Duon Weed Control Mat, made of Phillips Fibers nonwoven polypropylene. As a landscaper, you know how important that is to a plant's root system and to the future well-being of your big landscape jobs—especially those you use as references.

When water and air can't get through, plants die. Black plastic won't work for the long-term. And woven polypropylenes are nowhere near as permeable as nonwovens. For example, the air permeability for nonwoven Duon is about 14 times greater than for woven polypropylenes and the water permeability for Duon is about 10 times greater.

Put our words to the test. Hold Duon under running water, then take another piece and breathe through it. Then try the same test with a competitive weed control mat.

When covered from sunlight, Duon is virtually permanent. It allows plants to thrive and impedes about 95% of weed growth (in most areas). It also keeps mulch from going down into the soil.

For your quality landscape jobs, order Duon. For further information, call Phillips Fibers (803) 242-6600.

MARKETED THROUGH:

Blunk's 8923 South Octavia Bridgeview, IL 60455

On the West Coast:
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1055 Bertelsen Rd. • Eugene, OR 97402

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PHILLIPS FIBERS CORPORATION
A SUBSIDIARY OF PHILLIPS PETROLEUM COMPANY
TEXTILE NONWOVEN FABRICS MARKETING
P. O. BOX 66, GREENVILLE, SC 29602
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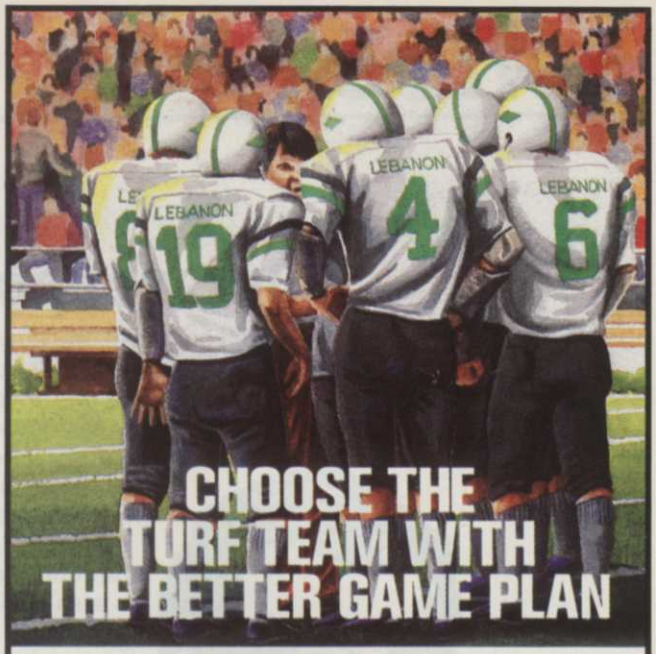

COUNTRY CLUB 19-4-6 FERTILIZER AND CRABGRASS PREVENTER WITH TEAM™

It's a contest that's played out on the ground—healthy grass pitted against crabgrass and goosegrass. But Country Club 19-4-6 Fertilizer and Crabgrass Preventer with Team™ has the defensive strength of benefin and trifluralin, yet it's gentle on your turf. The combination of these two proven herbicides kills the seeds of annual bluegrass, smooth and hairy crabgrass, goosegrass, as well as green and yellow foxtail as they germinate. And our premium quality fertilizer strengthens both Northern and Southern turfgrasses at the same time.

It can all be accomplished in one pass for full season control with Lebanon's new Country Club 19-4-6 Fertilizer and Crabgrass Preventer with Team™. Follow application instructions on the package—because successful teamwork hinges on everyone following the game plan.

Better turf care from the ground up.

If you have any questions about our new Country Club 19-4-6 Fertilizer and Crabgrass Preventer with Team™, or any of our other products and services, call our *Greenline* today at 1-800-233-0628; in Pennsylvania, call 717-273-1687. And start getting help with your game plan against crabgrass and goosegrass . . . from the ground up.

Lebanon
TOTAL TURF CARE
A division of Lebanon Chemical Corporation
P.O. Box 180 • Lebanon, PA 17042

Team™ and Diagonal Color Bar are the registered trademarks for Elanco Products Company's combination of benefin and trifluralin.

Circle No. 137 on Reader Inquiry Card

Our weapons are being fired upon

When you've got one of your most powerful aircraft carriers patrolling your own waters, and the enemy nukes it with an ICBM, do you just stand around sucking your thumb, or you do you alert your people at Cheyenne Mountain?

If you've got any guts—or common sense, for that matter—you don't just stand around. You defend yourself.

That scenario is a gross exaggeration of what's happening on the pesticide front, but it serves its purpose.

The Environmental Protection Agency has recently demanded supplemental data on some old tried-and-true turf chemicals, and it's also taking a close look at the toxicity of others. Witness the problems the industry is experiencing with mecoprop (MCPP), an effective broadleaf weed-killer, and diazinon, a trusty insecticide (see "Green Industry News").

In the case of the former, the producers of MCPP simply can't justify the multi-million dollar expense to comply with the data call-in the EPA is demanding. In the latter case, Ciba-Geigy promises to do everything in its power to convince the EPA that diazinon is perfectly safe if applied according to label directions.

But, more than these isolated instances, the problem will continue to grow as the EPA buckles down on the landscape manager's most effective weapons against insects, weeds and even diseases.

It's gratifying to see pro-pesticide concerns coalescing into effective defensive groups like the Pesticide Public Policy Foundation and Rational Approach to Pesticides. They, however, are just the cornerstone. They need building blocks upon which to expand.

You, reader—if you apply pesticides to turf or landscape plants—represent those building blocks. You can help your own cause by joining pro-pesticide groups in your area, by donating your time and by donating your money.

You are the ammunition in the green industry's arsenal.

Jerry Roche

Jerry Roche, editor

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Penneagle crowds out bluegrasses on Butler National's fairways

Triplex fairway mowing at The Butler National Golf Club, Oak Brook, IL

When Oscar Miles, CGCS, of The Butler National Golf Club, introduced Penneagle creeping bentgrass into his Poa annua infested A-20 bluegrass fairways in 1980, he took a dynamic step toward the beautiful fairways praised by the pros during the Western Open.

Utilizing a prescribed program of aggressive, deep core aerification, drop seeding and verticutting, Penneagle was expected to *aggressively compete* with the bluegrasses. With triplex mowing and clipping removal, the unwanted grasses are yielding to Penneagle.

Oscar feels that his fairways are *now* 70-90% Penneagle.

With Butler National's reputation at stake, Oscar Miles couldn't chance anything less than Penneagle for his "immaculate" fairways.

Warren Bidwell is available to talk to your superintendents' group about Butler National Golf Course and the "Penn Pals," Penncross, Penneagle and Pennway Blend, on your golf course. Call or write TEE-2-GREEN Corp. for details.

Penneagle blue tags earn cash or prizes.

Call or write us for details

Penneagle's Oregon certified blue tags qualify for cash awards to qualifying turf organizations for turf research. Call our toll-free number for details.

Marketed by **TEE-2-GREEN Corp.**, PO Box 250 Hubbard, OR 97032 1-**800-547-0255** TWX **510-590-0957**

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Seeding REBEL in late September

Only seven weeks after seeding, REBEL provides a rich carpet of dense, fine-leafed turf on Washington D.C.'s Congressional Country Club, Bill Black, Greens and Grounds Chairman.

Proven performance makes Rebel number one.

Rebel TURF TYPE TALL FESCUE

University tests across the country have proven most tall fescues have some good qualities; but in overall performance Rebel beats them all.

1982 Turfgrass Quality Ratings for Tall Fescue Varieties Tested at Eleven Locations in the United States

	University Test Location, Quality Ratings 1-9; 9 = Best											
Variety	**NE**	**KS**	**MO**	**IL**	**GA**	**KY**	**MD**	**MS**	**NC**	**NJ**	**VA**	**AVERAGE**
REBEL	6.7	7.7	7.0	5.6	8.2	7.5	6.5	4.8	7.0	7.6	6.8	6.9
Falcon	6.3	7.6	6.8	5.3	7.7	6.9	6.6	4.8	6.2	7.3	6.4	6.5
Olympic	6.3	7.3	—	5.0	8.1	6.5	6.3	4.2	5.8	6.6	6.4	6.3
Clemfine	—	7.2	—	—	7.3	6.3	5.9	4.1	6.3	4.6	5.9	6.0
Galway	—	7.0	—	5.1	7.5	6.0	6.4	4.8	6.1	5.1	5.5	5.9
KY-31	5.1	7.2	5.5	5.3	6.8	6.3	5.2	4.1	5.9	3.6	5.4	5.5

In these trials, turfgrass varieties were evaluated for appearance, establishment and quality of stand, resistance to drought and disease, and mowing qualities. REBEL took top honors in all-around attractiveness and performance:

- Resists heat, drought and disease
- Fine-textured (30% finer-leaved than Kentucky 31)
- Dense stand (188% denser than Kentucky 31)
- Excellent shade tolerance
- Rich color
- Fast establishment

For an all-around, top-performing tall fescue, try REBEL. Test it for yourself.

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